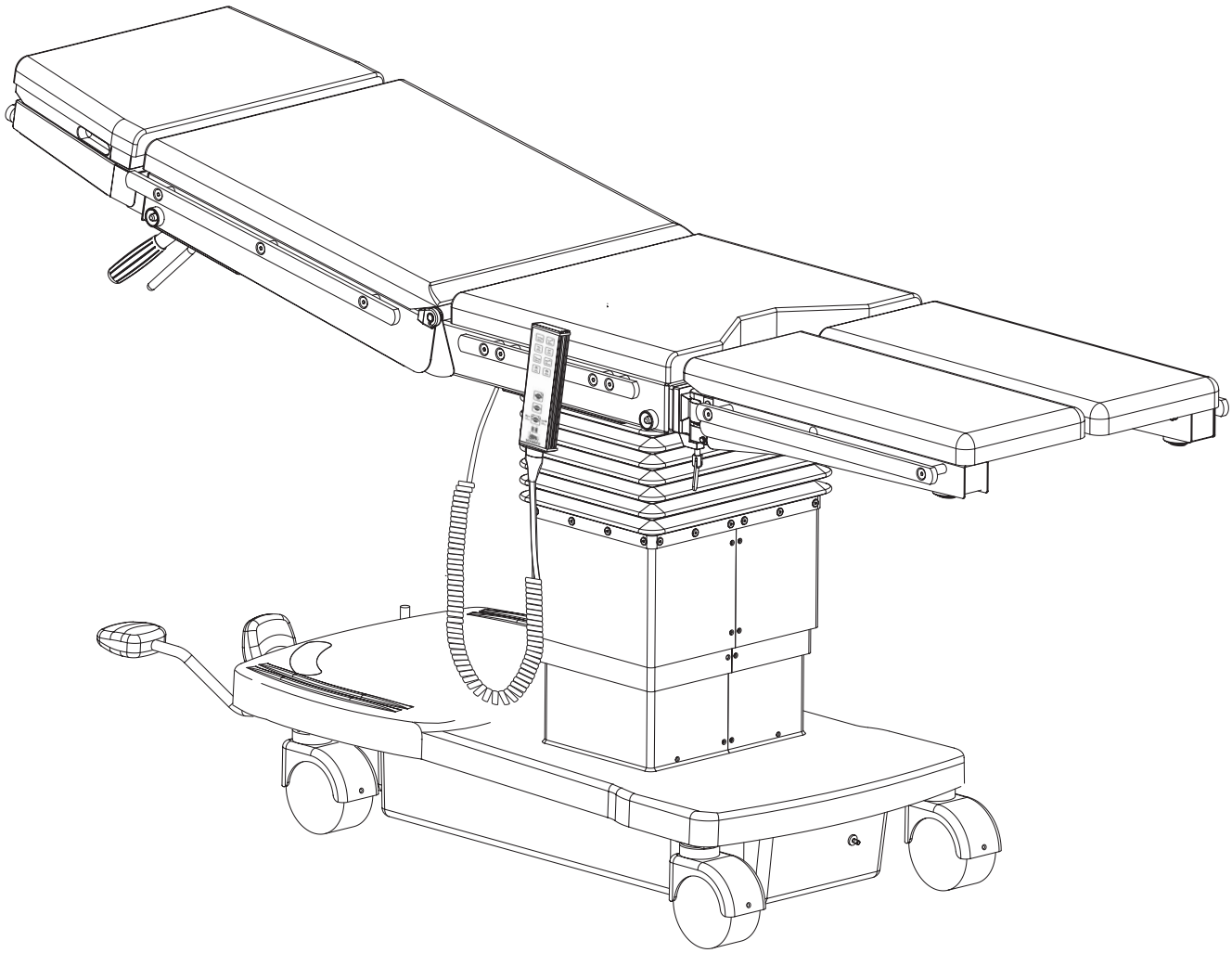
Service manual
Operating table OPX mobilis and OPX mobilis RC



CE

This service manual contains instructions how to carry out repairs on the mobile operating tables

- OPX mobilis 200
- OPX mobilis 300 C
- OPX mobilis 300 CL
- OPX mobilis 300 CE
- OPX mobilis 300 CLE
- OPX mobilis RC30
- OPX mobilis RC30L
- OPX mobilis RC40

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Introduction

About this service manual

In this paragraph you will find information about the lay-out of this service manual and explanations regarding the marks and symbols used in the text.

This service manual contains instructions how to carry out repairs on the operating tables OPX mobilis, also called operating tables in the following.

Our products are constantly being improved, this is why constructional changes carried out after printing of this service manual could not be taken into consideration. In case of any questions, we therefore kindly ask you to contact Schmitz u. Söhne.

In addition to this service manual and the obligatory regulations for the prevention of accidents effective in the user's country and on the site of use, the acknowledged rules for safe and professional work are also to be observed.

Symbols used in the text

In this service manual following designations or signs are used for pieces of information of special importance

Danger!
This symbol will appear wherever safety hints are designed to protect people from physical harm. The symbol stands for imminent danger of death or serious injury.

Caution!
This symbol will appear where situations are described which might be dangerous, and which might inflict slight injuries.

Attention!
This symbol will appear in front of warning hints which shall prevent the table or other equipment from being damaged.

This symbol will appear in front of additional helpful pieces of advice.

- A dot in front of the text means:
  This is what you have got to do.

– A dash in front of the text means:
  This is part of a listing.

Safety instructions

The operating table OPX mobilis has been constructed according to the latest state of engineering and according to the acknowledged rules of safety engineering. Nevertheless, its use may inflict danger to life or physical safety of the user or of third parties, or impairment to the operating table or other material assets.

Do not use the operating table unless in perfect condition and only for its intended use, with regard to safety and possible dangers, and observing the operating manual! Any malfunction which may affect the safety has to be eliminated immediately!

Electrically conductive double castors, electrically conductive pads and a potential equalization socket are standard features of the operating table OPX mobilis. An electrically conductive floor provided, the operating table OPX mobilis may be used in area M. If the operating OPX mobilis is equipped with non-electrically conductive (coloured) pads, it must not be used in area M.

Always keep the operating manual at hand at the site of use of the operating table!

Additionally to the operating manual, observe the general rules implied by the law and otherwise obligatory for accident prevention and environmental protection!

Do not carry out any modifications, extensions or reconstructions of the operating table unless approved by the manufacturer.

Spare parts have to meet the requirements stipulated by the manufacturer. This is always guaranteed when using original spare parts.

Observe the intervals prescribed or stated in the operating manual for periodical check-ups!

Take care that running and process materials as well as parts replaced are disposed of safely and with minimum environmental impact!

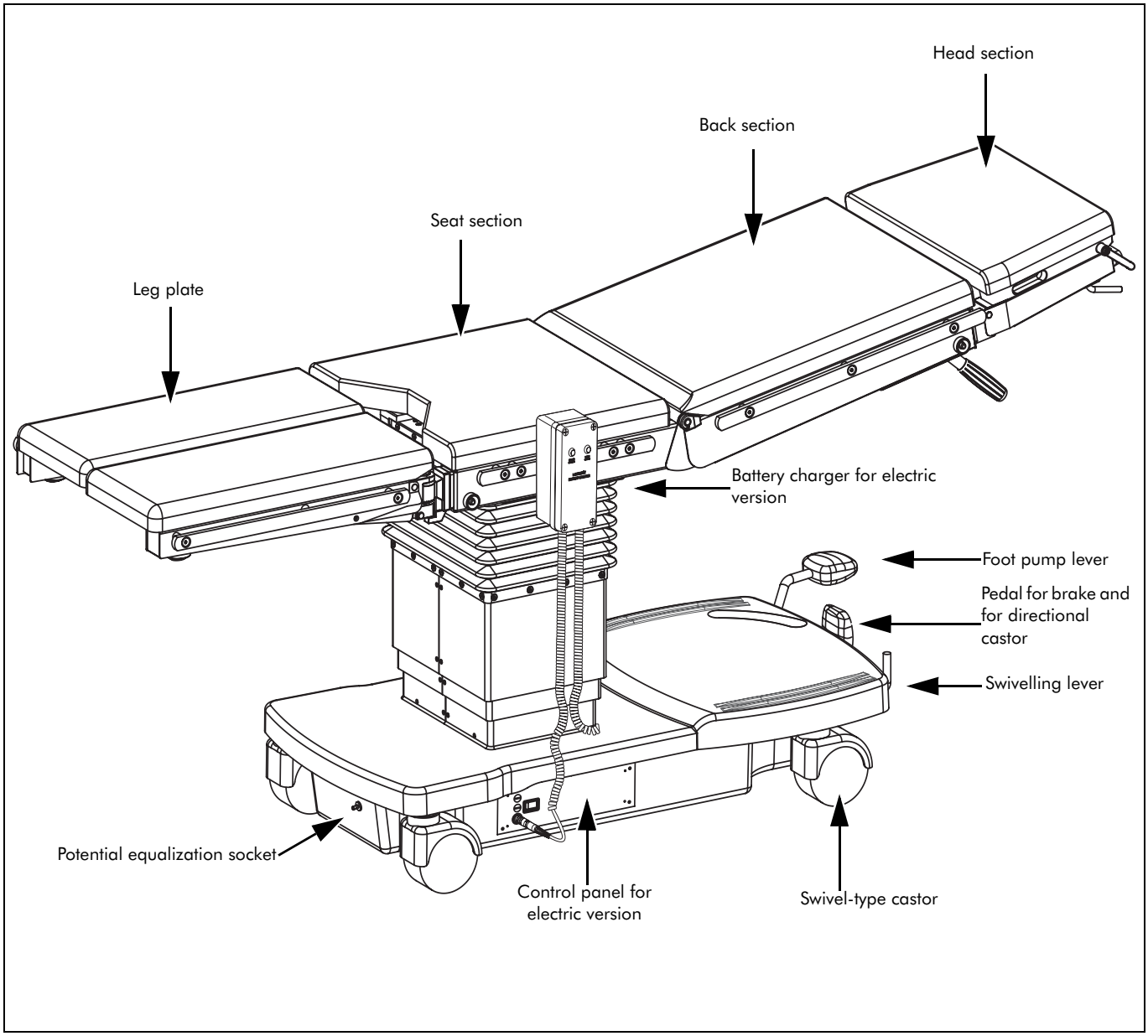
Intended use

According to the German VDE (i. e. the Association of German Electrical Engineers) 0107 standard, the operating table OPX mobilis may be used inside rooms of the application groups 0, 1 or 2. It is exclusively designed for purposes of human medicine. The operating table serves to position patients during an examination or during surgical interventions. The nursing staff has to take care to position the patients in such a way as to prevent any danger to their respiration, to their nervous system or to their circulation. This is especially important when patients are under anaesthetics. Any use apart or beyond these purposes is not intended. The manufacturer is not liable for any damage resulting of such non-intended use, which would be entirely at the user's risk.

The operating table may only be handled by persons who have been briefed in its professional handling and who have familiarized themselves with the product by means of the operating manual.

Intended use also means following the operating manual and observing the conditions for inspection and maintenance.

Description of the operating table



In the following service manual the terms left, right, front, and rear are used as seen by a person sitting or lying on the operating table.

The operating tables OPX mobilis can be equipped differently, depending on the model.

All operating table models are mobile. They are equipped with four electrically conductive double castors with central locking device. The operating tables with a "C" in their type designation as well as the RC models have got an additional directional castor.

All operating table models are equipped with mechanically operated hydraulic pumps. The operating tables of the model series 200 have got two hydraulic adjustment functions: Height adjustment Raise/Lower and Trendelenburg/Reverse Trendelenburg adjustment. The operating tables of the model series 300 and RC have got an additional lateral adjustment function. The tables of the RC40 model series feature a fourth hydraulic adjustment function, which is additional hydraulic adjustment of the back section.

Operating tables with an "E" in their type designation are equipped in addition with an electrically-driven hydraulic pump. These operating tables are also equipped with a hand-held control unit to operate the electro-hydraulic pump.The different table functions to be carried out by the hydraulic system are preselected by means of the selector lever.

The RC operating table models, same as the E-type models, are driven electrically, however, the table functions to be carried out by the hydraulic system are operated directly by means of the hand-held control unit. By means of the hand-held control unit, it is also possible to operate a 0 position function, which makes the table return into horizontal and lowest position. Moreover, the assignation of the functions on the hand-held control unit can be reversed by means the "Reverse" function, in order to enable a correct operation when the patient is positioned in reverse orientation on the operating table.

All operating table models with electric operation are equipped with rechargeable batteries inside the floor pan.

The operating tables with an "L" in their type designation are equipped with a table-top with longitudinal displacement function. By means of this feature, such parts of the patient's body can be screened which are otherwise inaccessible to the C-arm equipment.

The operating tables with a "G" in their type designation are equipped with an integrated kidney bridge. The integrated kidney bridge is adjusted in height hydraulically by means of the foot pump of the table.

All operating tables can be optimally adapted to various applications by means of accessories. All operating tables can be equipped with X-ray cassettes, which can be inserted below the table-top either from the head end or from the foot end.

According to the regulations of the European Standard 60601-2-46 the operating tables are designed to carry a maximum patient weight of 135kg. In case a higher charge is intended, please observe the instructions given below.

A patient weight of max. 135 kg allows all surgical interventions to be carried out in either orientation of the patient (patient's head lying at head or foot end of the table), provided the castors of the operating table are blocked.

In the case of normal patient orientation and table-top in mid-position (for operating tables with longitudinal displacement function) the operating table may be charged with a patient weight of max. 185 kg. When transferring a patient, or when letting a patient mount the operating table, make sure that the table is charged principally on the table column. Familiarize yourself with the reactions of the operating table under this kind of charge before starting a surgical intervention.

Pads

The operating tables are normally equipped with black antistatic pads. Coloured pads, which, however, are not electrically conductive, are available upon special request. The antistatic black version fulfils the limits of resistance according to ISO 2882. Coloured pads are not electrically conductive, which means that in this case the operating table is not explosion-proof.

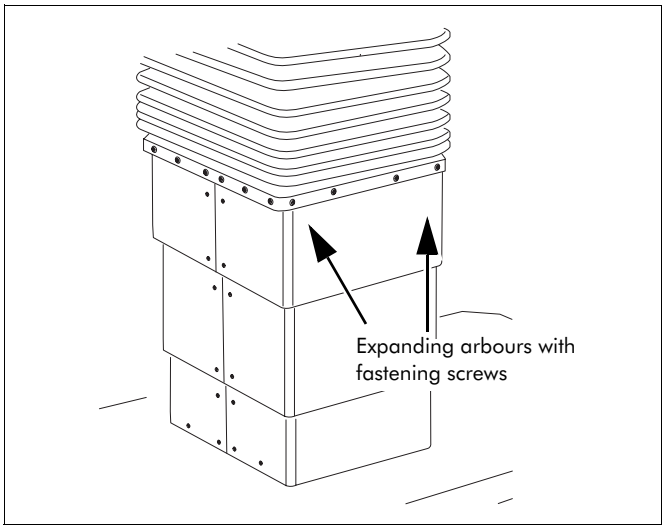
Repairs

Preparations

Removing and re-attaching the cladding panels

The bellows is attached to the upper cladding panel by means of screws and expanding arbours. In order to remove the cladding panels, the bellows has to be detached first from the upper cladding panel.

Detaching the bellows



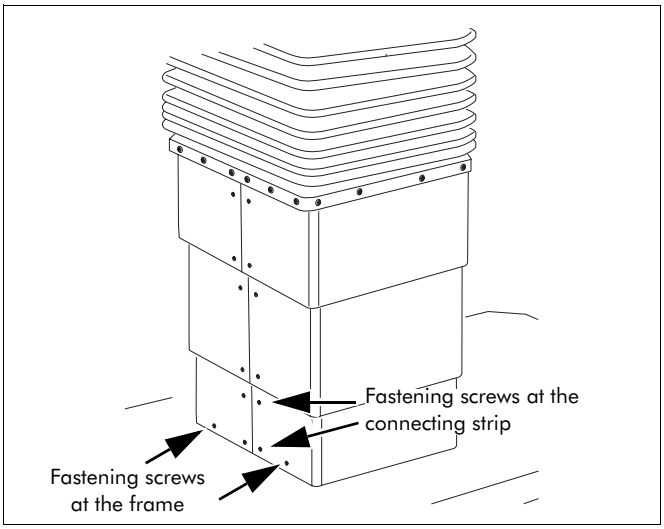
- Screw out four screws each at both sides and six screws each at the front and at the rear.
- Pull the expanding arbours out of the holes in the upper cladding panel and lift the bellows.

The four fastening screws at the upper rim of the upper cladding panel are now accessible.

Detaching the cladding panels

The cladding panels consist of two parts, which are interconnected by means of connecting strips. The upper and lower cladding panels are fixed to the frame. In order to detach the cladding panels, loosen the fastening screws at the connecting strips and detach the upper and lower cladding panels from the frame.

For some kinds of repairs it is sufficient to raise the column and loosen only the four upper or lower screws. The cladding sheets can then be pushed up or down.



- Loosen two fastening screws each at the left and right hand side of one section of the cladding panels.
- Loosen the upper and lower cladding panel from the frame as well and pull the cladding panels apart.

The height adjustment column is now accessible, and repairs can be carried out. When the repairs have been finished, the cladding panels have to be re-attached.

Re-attaching the cladding panels

The cladding panels have to be re-attached in reverse order.

- Place the lower cladding panels onto the mobile base and connect them by means of the screws screwed into the connecting strips. Fix the cladding panels to the frame by means of the fastening screws.
- First, fix the middle and then the upper cladding panels to the connecting strips. Fix the upper cladding panel to the frame by means of the fastening screws.

Re-attaching the bellows

The bellows is re-attached in reverse order.

- Press the expanding arbours into the holes in the upper cladding panel and then press or screw the screws into the expanding arbours.

The bellows is now re-attached.

Removing and re-attaching the cladding of the mobile base

Removing the cladding of the mobile base

The cladding of the mobile base can be removed. In order to carry out repairs on the table base, the cladding can be fastened to the upper section of the operating table by means of a piece of string.

- Adjust the table-top and the back section into horizontal position.
- Lift the cladding of the mobile base up to the lower side of the table-top. Fix it there using a piece of string tied to the side rails.

Now repairs on the table base can be carried out. When the repairs have been finished, the cladding has to be placed back onto the mobile base.

Placing the cladding back onto the mobile base

- Untie the string fixing the cladding of the mobile base to the side rail.
- Place the cladding back onto the mobile base.

Replacing or lowering the floor pan

For some kinds of repairs, the floor pan has to be removed. The floor pan is fixed to the mobile base by means of two screws each at the sides and two additional screws at the front. In addition, the floor pan engages on top of a bolt head on each side of the foot pump.

Preparation

- In order to remove the floor pan, detach the cladding panels at the height adjustment column. You will find details under “Removing and re-attaching the cladding panels” on page 11.

- Remove the cladding of the mobile base. You will find details under “Removing and re-attaching the cladding of the mobile base” on page 13.
- Remove the bolt lock from the bolts of the actuating rod and pull the actuating rods off to the outside.

For certain kinds of repairs it is sufficient to lower the floor pan. The control box remains inside the floor pan.

- In the case of E type models: Remove the control box. You will find details in the chapter “Removing and installing the control box in mobilis 300 E table models” on page 51 or in the chapter “Removing and installing the control box in mobilis RC table models” on page 53.
- Prepare the necessary tools for jacking the operating table up.

Removing or lowering the floor pan

- Loosen the two fastening screws at the front and the four fastening screws at the sides of the mobile base. At the same time, loosen also the earthing cable of the control box.
- Loosen the connecting cable for the potential equalization socket from the frame of the mobile base.
- Lever the floor pan, e. g. by means of a screwdriver, over the bolt heads at the foot pump and over the shaft of the brake lever.
- Pull the floor pan carefully down and out by slightly moving it.

Now repairs at the underside of the mobile base can be carried out.

Installing the floor pan

The floor pan can be installed in reverse order.

- Put the floor pan back into place and fix the connecting cable for the potential equalization socket to the frame of the mobile base.
- Screw the two fastening screws at the front and the four fastening screws at the sides of the frame in. At the same time, also connect the earthing cable of the control box to the left hand rear fastening screw.

Final tasks

- Re-install the control box
- Put the cladding of the mobile base back into place.
- Re-attach the cladding panels at the height adjustment column.

Detaching and re-attaching the table-top

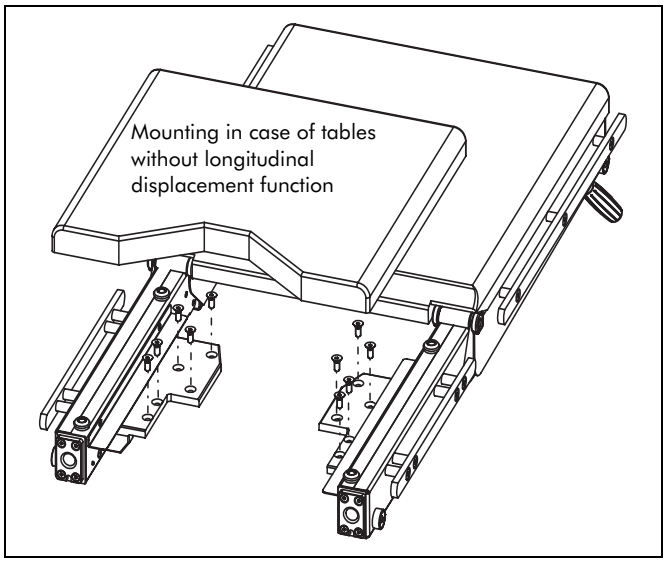
For some kinds of repairs, the table-top has to be detached. The table-top is fixed to a holding plate on top of the height adjustment column.

Preparation

- Remove the leg plates, the head plate and the pads of the seat and back sections.
- If a universal adapter is at hand, insert it into the seat section. Otherwise, insert the head plate into the seat section in order to stabilize the frame.

Detaching the table-top

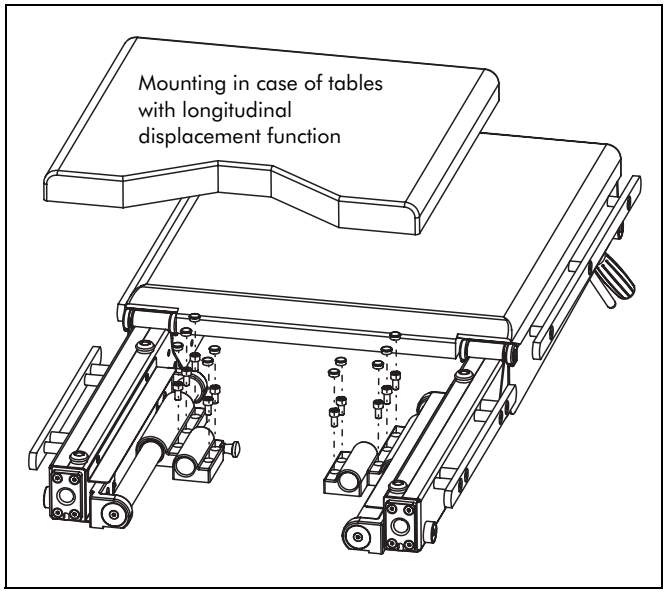
The position and quantity of the fastening screws are different in the table models with and without longitudinal displacement function of the table-top. However, the work to be carried out is similar.



RC table models with longitudinal adjustment function and with integrated kidney bridge

The RC table models with longitudinal adjustment function and with integrated kidney bridge have got a plastic cladding which is fixed to the cheeks by means of expansion rivets.

- Drive the pins of the expansion rivets out, pull the expansion rivets out and lift the plastic cladding off.



Disconnecting the hydraulic system between the upper section and the lower section for the kidney bridge and for the RC 40 model

At the cover plate of the height adjustment column of the RC 40 operating table models you will find the piloted check valve for back section adjustment. The hydraulic hoses leading to the actuating cylinders are accessible from above, and the hydraulic hoses coming from the gate valve are connected to the underside of the check valve. The hydraulic hose for the integrated kidney bridge is also conducted through the block of the piloted check valve. The hydraulic hoses between the upper section and the lower section have to be disconnected at the check valve in order to remove the table-top.

- In order to disconnect the hydraulic hose between the upper section and the lower section, loosen the screw joint of the hydraulic hoses at the check valve, and close the hydraulic hoses immediately.
- If there is a kidney bridge, loosen the corresponding hydraulic hose at the T-piece. Close the hose immediately afterwards.

- For operating table models RC 30 with kidney bridge: Loosen the screw joint at the T-piece. Close the T-piece immediately afterwards.
- Then loosen the clamping sheet for the T-piece.

The hydraulic systems of the upper section and of the lower section are now separated.

- In order to detach the table-top, remove the covers of the fastening screws.
- Remove the fastening screws fixing the seat section on top of the table column.
- Lift off the table-top.

Re-attaching the table-top

- In order to re-attach the table-top, position the table-top on top of the table column and adjust it.
- Screw the fastening screws in and tighten them.

Connecting the hydraulic system

- Re-establish the connection between the hydraulic systems of the upper section and of the lower section. If required, top the hoses up with hydraulic fluid.

Final tasks

- Attach the head plate and the leg plates and put the pads back on top of the seat and back sections.
- Check the functions of the receptacles for the accessories and of the back section adjustment, and check if the head plate and the universal adapter can still be inserted easily into the seat section.

Height adjustment column

Filling new hydraulic cylinders with hydraulic fluid and installing them

New hydraulic cylinders together with their check valves as well as the hydraulic hoses have to be filled with hydraulic fluid upon installation.

- In order to fill a new hydraulic cylinder with hydraulic fluid, push the piston rod of the hydraulic cylinder completely in. Connect the hydraulic hoses firmly with the check valve.
- Connect the tubes of the check valves at the hydraulic cylinder, but let them remain loose, pulling the tubes slightly out of their seat.
- Turn the hydraulic cylinder in such a way as to make the piston rod point to the ceiling. Make the piston rod extract by means of the selector lever. Pump hydraulic fluid carefully into the piston end of the cylinder using the foot pump. As soon as hydraulic fluid emerges from the loose screw joint, tighten the screw joint. Make the piston rod extract completely.
- Turn the hydraulic cylinder in such a way as to make the piston rod point to the floor. Make the piston rod retract by means of the selector lever. Loosen the screw joints at the piston end of the hydraulic cylinder, pulling the tube slightly out of its seat. The screw joints at the piston rod end are still loose. Wait 2 to 5 minutes until the residuary air has ascended inside the piston end of the cylinder. Pump hydraulic fluid carefully into the piston rod end of the cylinder. As soon as hydraulic fluid emerges from the loose screw joint at the piston rod end of the cylinder, tighten the screw joint.
- Go on pumping hydraulic fluid carefully into the cylinder until the residuary air has been discharged from the screw joint at the piston end of the cylinder. Then tighten the screw joint at the piston end of the cylinder. Make the piston rod retract completely.
- Turn the hydraulic cylinder in such a way as to make the piston rod point to the ceiling. Make the piston rod extract by means of the selector lever. Loosen the screw joint at the piston rod end again, pulling the tube slightly out of its seat. Wait 2 to 5 minutes until the residuary air has ascended inside the piston end of the cylinder. Pump hydraulic fluid carefully into the piston end of the cylinder using the foot pump. As soon as the residuary air has been discharged from the loose screw joint at the piston rod end of the cylinder, tighten the screw joint.

- Install the de-aerated hydraulic cylinder.
- If there is still a remainder of air left inside the hydraulic system, which affects the stability of the table-top, de-aerate the system as described in the following paragraph.

De-aerating the lateral and Trendelenburg adjustment cylinders and the check valves

If the table-top is unstable after replacement of the lateral or Trendelenburg adjustment cylinder, we recommend to proceed as follows in order to attain optimal stability.

- Remove the connected lateral or Trendelenburg adjustment cylinder together with the corresponding check valve from the height adjustment column. You will find details regarding the bolt fastenings in the chapter “Removing the hydraulic cylinder for lateral adjustment” on page 20 or in the chapter “Removing the hydraulic cylinder for Trendelenburg adjustment” on page 23.
- Turn the hydraulic cylinder in such a way as to make the piston rod point to the ceiling. Make the piston rod extract by means of the selector lever. Wait 2 to 5 minutes until the residuary air has ascended inside the piston rod end of the cylinder. Then loosen the screw joints at the piston rod end of the hydraulic cylinder, pulling the tube slightly out of its seat. The screw joints at the piston end are still loose. Pump hydraulic fluid carefully into the piston end of the cylinder. As soon as hydraulic fluid emerges from the loose screw joint, tighten the screw joint. Then make the piston rod extract completely.

- Turn the hydraulic cylinder in such a way as to make the piston rod point to the floor. Make the piston rod retract by means of the selector lever. Wait 2 to 5 minutes until the residuary air has ascended inside the piston end of the cylinder. Then loosen the screw joints at the piston end of the hydraulic cylinder, pulling the tube slightly out of its seat. Pump hydraulic fluid carefully into the piston rod end of the cylinder using the foot pump. As soon as the residuary air has been discharged from the loose screw joint, tighten the screw joint. Then make the piston rod retract completely.

- Repeat these procedures until there is no more air left in the hydraulic fluid inside the cylinder.

Replacing the check valve and the hydraulic cylinder for lateral adjustment

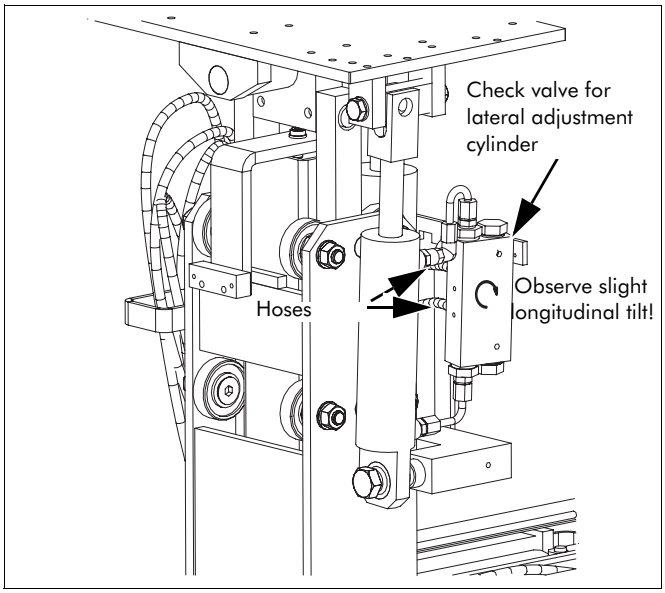
All operating tables can be adjusted by means of hydraulic cylinders. The hydraulic cylinders are equipped with check valves. Hydraulic cylinders and check valves can be replaced.

Preparation

- In order to replace one of the check valves or one of the hydraulic cylinders, detach the cladding panels of the height adjustment column. You will find details under "Removing and re-attaching the cladding panels" on page 11.

Removing the check valve at the hydraulic cylinder for lateral adjustment

- Make the hydraulic cylinder retract completely.



- Mind the position of the hydraulic hoses at the check valve in order not to confound the directions of motion.
- Loosen the sleeve nuts at the two hydraulic hoses and at the two tubes connected to the valve.
- Loosen also the sleeve nuts at the tubes at the hydraulic cylinder.
- Remove the check valve from the hydraulic cylinder.

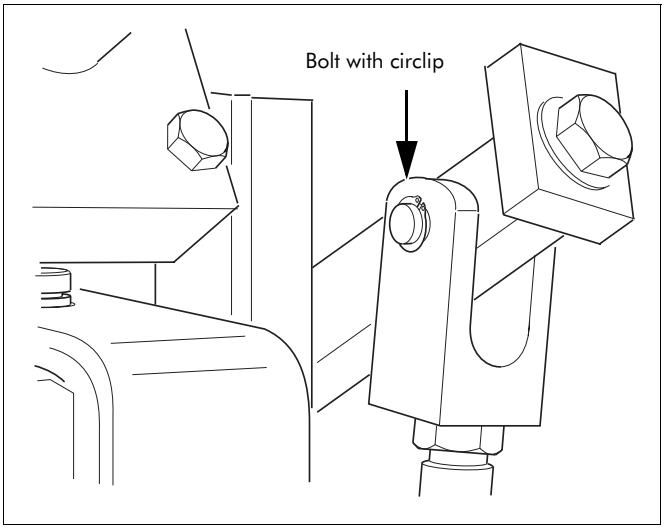
Installing the check valve at the hydraulic cylinder for lateral adjustment

- Connect the check valve to the hydraulic tubes and retighten all sleeve nuts at the tubes. Mind the tilt position of the check valve.
- Refasten the hydraulic hoses at the check valve.

- De-aerate the system afterwards. You will find details in the chapters "Filling new hydraulic cylinders with hydraulic fluid and installing them" on page 17 and "De-aerating the lateral or Trendelenburg adjustment cylinder and the check valves" on page 18.

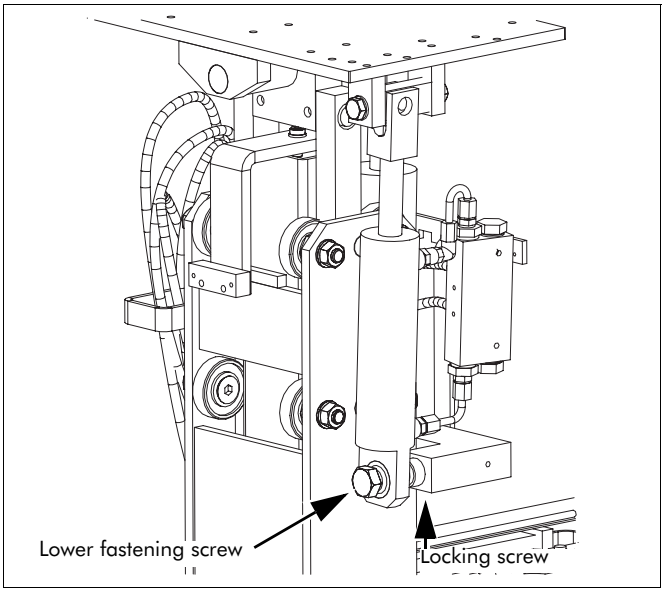
Removing the hydraulic cylinder for lateral adjustment

The rod of the hydraulic cylinder for lateral adjustment is connected to the table-top. A bolt is driven through the fork rest on top of the rod of the hydraulic cylinder and through the bearing eye at the table-top. The bolt is secured by means of circlips.



- Remove the check valve.

- In order to detach the hydraulic cylinder from the upper bearing, remove the circlip at the bolt of the upper bearing and start the bolt.
- Lift the table-top up, so that the upper bearing is exposed.



- In order to detach the hydraulic cylinder from the lower bearing, loosen the locking screw, screw the lower fastening screw out, remove the washer guarding this screw against twisting, and take out the hydraulic cylinder.

Installing the hydraulic cylinder for lateral adjustment

Attention!
Mind the exact guiding of the hydraulic hoses, and especially the position of the laces at the hoses and at the cables. The initial state has to be exactly restored.

If an important loss of hydraulic fluid has occurred during assembly or replacement of a hydraulic cylinder, hydraulic fluid has to be topped up as required.

- Top the hydraulic cylinder up with hydraulic fluid. You will find details in the chapter “Filling new hydraulic cylinders with hydraulic fluid and installing them” on page 17.
- Fix the hydraulic cylinder to the lower bearing by means of the fastening screw, together with the washer guarding this screw against twisting, and screw the locking screw in.
- Lower the table-top, so that the bearing eye rests in the fork rest, drive the bolt in and put on the circlip.

Before re-attaching the cladding, make sure that there are no kinks in the hydraulic hoses, and that they are able to follow all movements of the cylinder.

Replacing check valves and hydraulic cylinder for Trendelenburg adjustment

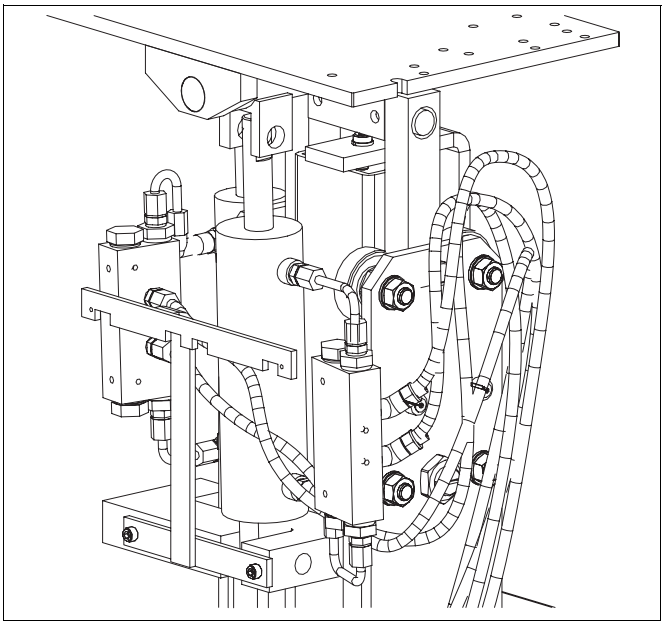
All operating tables can be adjusted by means of hydraulic cylinders. The hydraulic cylinders are equipped with check valves. Hydraulic cylinders and check valves can be replaced.

Preparation

- In order to replace one of the check valves or one of the hydraulic cylinders, detach the cladding panels at the height adjustment column. You will find details under "Removing and re-attaching the cladding panels" on page 11.

Removing the check valves at the hydraulic cylinder for Trendelenburg adjustment

- Make the hydraulic cylinder retract completely.



- Mind the position of the hydraulic hoses at the check valve in order not to confound the directions of motion.
- Loosen the sleeve nuts at the two hoses and at the two tubes, which are connected to the valve.
- In addition, loosen the sleeve nuts at the tubes at the cylinder.
- Remove the check valve from the hydraulic cylinder.

Installing the check valve at the hydraulic cylinder for Trendelenburg adjustment

The inner construction of the check valves of the operating tables with electro-hydraulic adjustment differ from those of the operating tables with manually-hydraulic adjustment.

- Place the check valve onto the hydraulic tubes and tighten all sleeve nuts at the tubes. Mind the tilt position of the check valve.
- Refasten the hydraulic hoses at the check valve.

- De-aerate the system. You will find details in the chapters "Filling new hydraulic cylinders with hydraulic fluid and installing them" on page 17 and "De-aerating the lateral or Trendelenburg adjustment cylinder as well as the check valves" on page 18.

Removing the hydraulic cylinder for Trendelenburg adjustment

The piston rod of the hydraulic cylinder is connected to the table-top. A bolt is driven through the fork rest on top of the piston of the hydraulic cylinder and through the bearing eye at the table-top. The bolt is secured by means of a locking screw.

- Remove the check valve.

- In order to detach the hydraulic cylinder from the upper bearing, unscrew the locking screw and start the bolt.
- Lift the table-top, so that the upper bearing is exposed.
- In order to detach the hydraulic cylinder from the lower bearing, unscrew the locking screw. Remove the bearing bolt using an M8 screw and a pair of pliers or a gear puller.

Installing the hydraulic cylinder for Trendelenburg adjustment

- Install the new hydraulic cylinder. You will find details in the chapters "Filling new hydraulic cylinders with hydraulic fluid and installing them" on page 17 and "De-aerating the lateral or hydraulic cylinder as well as the check valves" on page 18.
- Fix the hydraulic cylinder to the lower bearing by means of the bolt and the locking screw.
- Lower the table-top so that the bearing eye rests in the clevis, drive the bolt in and screw the locking screw in.

Attention!
Mind the exact guiding of the hydraulic hoses and especially the position of the laces at the hoses and at the cables. The initial state has to be exactly restored.

In case of an important loss of hydraulic fluid occurred during the assembly or during replacement of a hydraulic cylinder, top up hydraulic fluid as required.

Before re-attaching the cladding, make sure there are no kinks in the hydraulic hoses, and that they are able to follow all movements of the hydraulic cylinders.

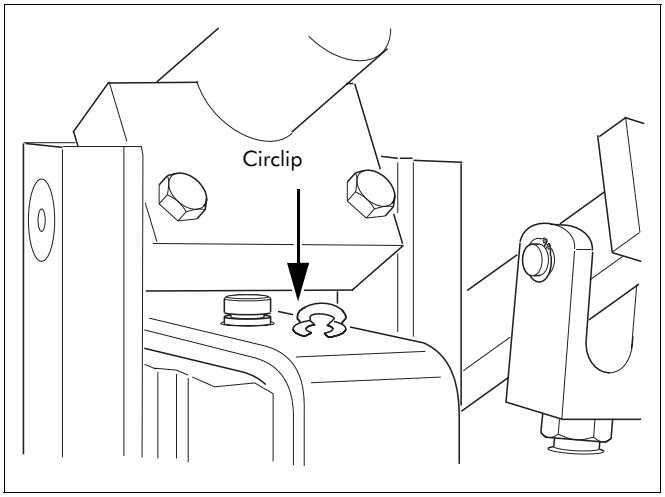
Sealing or replacing the hydraulic cylinder for height adjustment

The operating tables can be adjusted in height by means of a hydraulic cylinder. The hydraulic cylinder for height adjustment can be sealed.

Preparation

- Remove the table-top. You will find details under "Detaching and re-mounting the table-top" on page 15.
- Detach the cladding sheets at the height adjustment column. You will find details under "Removing and re-attaching the cladding sheets" on page 11.

Sealing the hydraulic cylinder for height adjustment



- Make the hydraulic cylinder for height adjustment retract completely.
- Remove the circlip at the upper mounting.
- Detach the four hydraulic hoses of the lateral cylinder and of the Trendelenburg cylinder at their lower ends.
- Loosen the lateral guidings of the height adjustment column. You will find details under "Adjusting the guidings of the height adjustment column" on page 27.
- In the case of E type models, detach the cable of the hand-held control unit.
- Pull out the internal member of the height adjustment column.
- Now detach the leakage hose from the height adjustment cylinder.
- Unscrew the upper section of the cylinder using two pairs of pliers and replace the seals.
- Reassemble the system in reverse order.
- Refasten the lateral guidings with sufficient initial tension as to prevent the column, without the table-top, from sinking by its proper weight. You will find details under "Adjusting the guidings of the height adjustment column" on page 27.

Replacing the hydraulic cylinder

- Position the table onto assembly jigs.
- Remove the floor pan. You will find details under "Replacing or lowering the floor pan" on page 14.
- Make the hydraulic cylinder for height adjustment retract completely.
- Remove the circlip at the upper mounting.
- Detach the four hydraulic hoses at the lateral adjustment cylinder and at the Trendelenburg cylinder at their lower ends.
- Loosen the lateral guidings of the height adjustment column. You will find details under "Adjusting the guidings of the height adjustment column" on page 27.
- In the case of E type models, detach the cable for the hand-held control unit.
- Pull out the interior member of the height adjustment column.
- Now detach the leakage hose from the height adjustment cylinder.
- Detach the hydraulic hose from the height adjustment cylinder. Loosen the lower fastening screw of the cylinder.
- Lift the height adjustment cylinder up and out.

Assembly

- Re-assemble the system in reverse order.
- Refasten the lateral guidings with sufficient initial tension as to prevent the column, without the table-top, from sinking by its proper weight. You will find details under "Adjusting the guidings of the height adjustment column" on page 27.

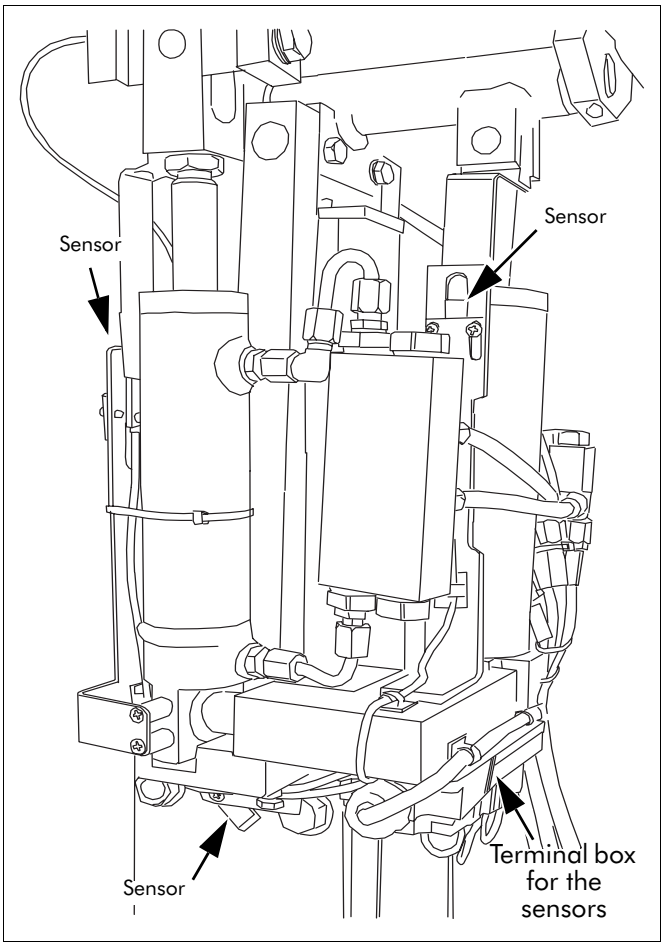
Attention!
Mind the exact guiding of the hoses and especially the position of the laces at the hoses and at the cables. The initial state has to be exactly restored.

Final tasks

- Check the function of the hydraulic cylinder for height adjustment.
- Make the lateral cylinder and the Trendelenburg cylinder carry out their individual movements several times and vent them. You will find details under "Installing the hydraulic cylinder for lateral adjustment" on page 21 or under "Installing the hydraulic cylinder for Trendelenburg adjustment" on page 23.
- Fix the cable for the hand-held control unit, making sure that the cable is still slack enough when the table-top is in maximum Reverse Trendelenburg and at the same time lateral tilt, right hand side, position.
- Check if the hoses and cables have been correctly installed by making the table carry out the complete up/down movement.
- Re-attach the cladding sheets at the height adjustment column.

Sensors in the mobilis RC

The sensors for 0 position in the RC table models are positioned next to the cylinders for Trendelenburg and for lateral adjustment. The sensor for height adjustment is positioned below the lateral adjustment cylinder. The sensor for back section adjustment is installed inside the left hand side of the seat section frame.



The sensors are connected to a green terminal box. The terminal box for the sensors is installed below the Trendelenburg cylinder. You will find details concerning the cabling of the terminal box and the colour code for the connections in the chapter "Cabling of the sensors in the mobilis RC30/40 models" on page 78.

Checking the functions of the sensors

The functional state of the sensors or of the terminal box can be checked by means of the LEDs at the sensors themselves and at the terminal box next to the corresponding connections. The LEDs at the sensor and at the terminal box should flash up as soon as a piece of metal, e. g. a screwdriver, is positioned in front of the sensor. The LED of the sensor for back section adjustment inside the seat section frame is covered.

The operating table is adjusted into horizontal and lowest position by pressing the 0 key on the hand-held control unit or on the foot control unit. The components of the operating table will return into initial position one after the other in following order: back section (RC 40 model only), lateral tilt, Trendelenburg adjustment, height adjustment. In case one of the sensors is defective or not adjusted correctly, the table will move into the end position of the relative function, and the following positionings are no longer activated.

Adjusting the sensors

Each of the sensors for lateral adjustment, for Trendelenburg adjustment and for height adjustment are fixed to an angle bracket inside an oblong hole. If 0 position is activated, the sensors for lateral adjustment and for Trendelenburg adjustment will respond to a second angle bracket. The height adjustment sensor is activated by means of the cross-bar of the mobile base. If one of the sensors does not respond while 0 positioning is being carried out, the sensors can be readjusted after loosening of the fixing screws. The distance between the sensor and the second angle bracket or the cross-bar must not exceed 5mm.

Adjusting the guidings at the height adjustment column

All operating table models are adjustable in height by means of the height adjustment column with hydraulic lift. The inner telescopic column is guided by means of plastic screws installed at both sides. By turning the plastic screws, the lateral free motion of the telescope column can be adjusted.

The inner column is in addition guided by means of four ball bearings each at the front and at the rear. The ball bearings at the rear are eccentric. The guiding of the inner column can be adjusted by twisting the eccentric ball bearings.

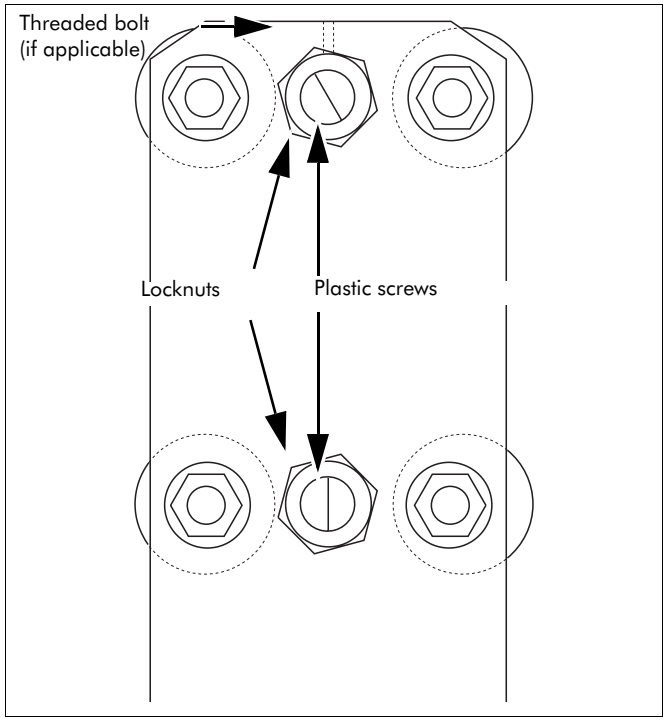
Preparation

- In order to re-adjust the guidings of the height adjustment column, detach the cladding panels at the height adjustment column. You will find details under “Removing and re-attaching the cladding panels” on page 11.

Re-adjusting the lateral guidings

On the right hand side of the height adjustment column there are two plastic bearings. On the left hand side opposite there are two plastic screws. In the normal case the plastic screws are secured against twisting by means of locknuts.

In some table models, however, the upper plastic screws are not secured by means of locknuts, but by means of threaded bolts.



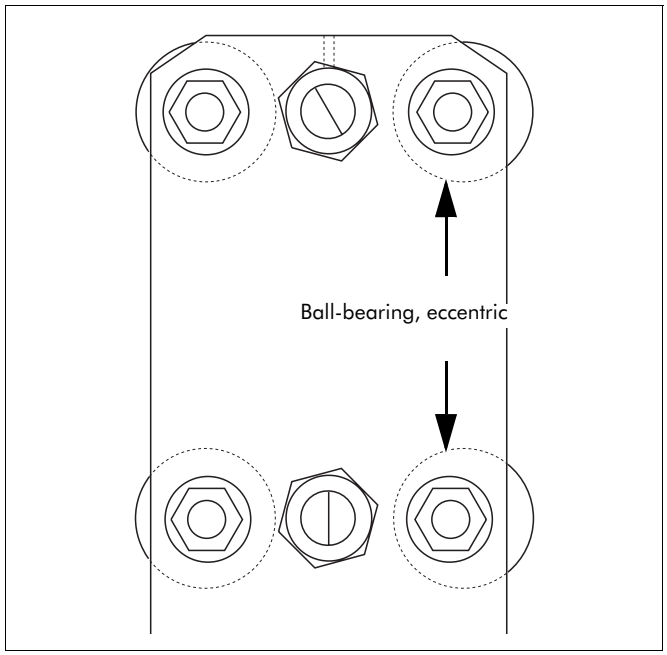
- In order to adjust the lateral free motion, loosen the locknuts at the plastic screws, and, if necessary, the upper threaded bolt.
- Screw the plastic screws in one by one in order to reduce the lateral free motion, or screw the plastic screws out in order to raise the lateral free motion.

Tighten the plastic screws with a preload of a 1/8 revolution approximately. Use only a screwdriver in order to tighten them. If they are screwed in too tightly the table-top may move jerkily when being lowered.

- Finally secure the plastic screws against twisting by tightening the locknuts and also the threaded bolt, if there is one.

Adjusting the guidings of the ball bearings

The inner column is guided by means of four ball bearings each at the front and at the rear. The ball bearings at the rear are eccentric.



- In order to adjust the guiding of the inner column, loosen the locknut at one of the rear ball bearings.

Attention!
If the guidings are adjusted too tightly, the ball bearings may get damaged. Adjust the ball bearings in such a way that the column glides easily over the whole height adjustment range.

It is part of the normal function if individual ball bearings come to a temporary standstill while the inner column is moving.

- Apply a 30 mm open-end spanner to the outside of the ball bearing and adjust the distance between the ball bearing and the column by revolving it. Retighten the locknut afterwards.
- If required, repeat this procedure at the remaining ball bearings.

Final tasks

- Check the function of the height adjustment column.
- Re-attach the cladding panels at the height adjustment column.

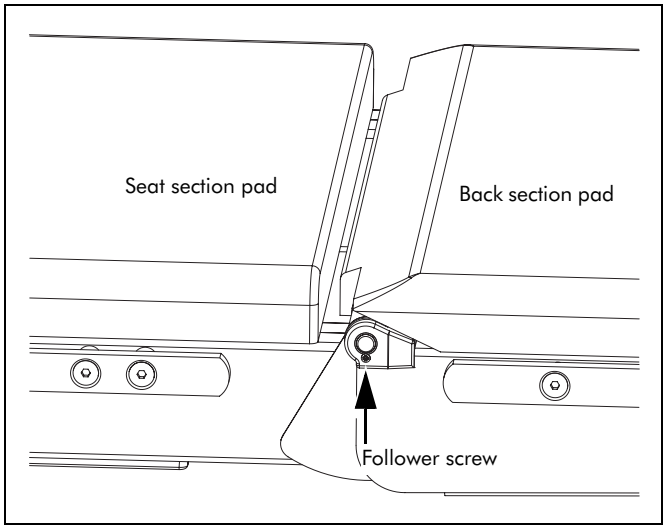
Table-top

Folding the back section on top of the seat section

The back section of the table has to be folded on top of the seat section in order to carry out repairs at the upper part of the height adjustment column. In order to do so, loosen first the bolt fastenings of the gas springs - in the mobilis RC 40: the relative hydraulic cylinder for back section adjustment - at the seat section frame.

- In order to fold the back section on top of the seat section, remove the head plate and the pads for the back section and for the seat section.

Attention!
When the gas springs have been removed, the back section may fall down and thus damage the follower screw of the safety sheet between the seat and back sections. Screw the follower screw out.



- Screw the follower screws (M3) at the left and right hand side of the safety plate between the seat section and the back section out.
- Loosen the threaded bolts in front of the bearing bolts at the inner side of the seat section frame. Drive the right hand and left hand bearing bolts out using a drift bolt.
- Fold the back section on top of the seat section and carry out the repairs.
- As soon as the repairs have been carried out, fasten the gas springs and/or the hydraulic cylinders in reverse order to the seat section frame.

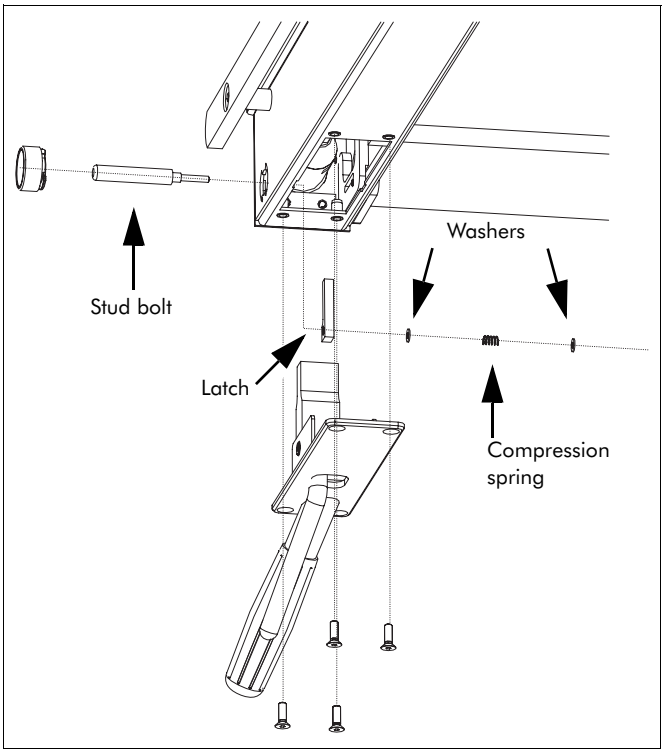
Replacing the latches at the seat and back sections

Head plate and leg plate are locked by means of latches. The locking mechanism can be replaced.

In case one of the latches has got jammed, push the release button, so that the bolt protrudes at the inside of the frame. Seize this part of the bolt by means of a pair of pliers and turn the bolt with the latch until the latch slides back into its guiding.

Removing the latches

At the sides of the locking devices there is a compressor inside a bearing. This compressor consists of a stud bolt with a screwed-on latch. The latch together with the bolt are pressed to the outside by means of a pressure spring. The locking mechanism inside the seat section is equipped in addition with a washer at the inside.



- Detach the claddings at the underside of the seat or back section – at the back section, also the pushing handle.

The threaded bolts are secured by means of screw locking varnish. They have probably to be heated before they can be unscrewed.

- Screw the bolt out of the threaded hole of the latch, pull the bolt out of the guiding and pull the latch, the pressure spring – and at the seat section, also the washer – downwards and out.

Installing the latches

- Insert a latch into the inner guiding, its groove pointing towards the receiver. Apply screw locking varnish and push the bolt, its smaller portion first, into the threaded hole in the latch.
- Insert the pressure spring – at the seat section, also the washer – behind the latch using a pair of pointed pliers, push the thread of the bolt to the threaded hole of the latch, and tighten the bolt.
- Check the function of the latch and close the cladding at the underside.

Replacing the gas springs at the back section and repairing the release mechanism

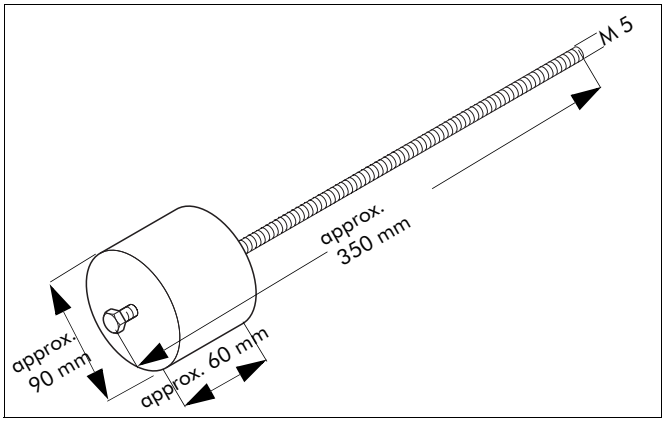
The back section of the OPX mobilis 200, mobilis 300 and mobilis RC 30 operating table models can be adjusted against the counterpressure of two gas springs. The RC 40 model does not have gas springs for back section adjustment, but hydraulic cylinders. You will find details regarding replacement of the hydraulic cylinders in the chapter “Replacing the hydraulic cylinders for back section adjustment in the RC40 models” on page 35.

The gas springs are installed in the left and right hand frame of the back section. At the top of each gas spring there is a trigger head, which is activated by means of a hydraulic cylinder.

When the gas springs are released, a hand lever exerts pressure onto a hydraulic cylinder. The pressure developed is directed via hydraulic hoses to the two trigger heads at the gas springs. This way the gas springs are released simultaneously and can be adjusted.

The trigger heads at the top of the gas springs serve at the same time as bearings.

In order to start the bearing bolts a special drift bolt is required, which can be prepared according to the measurements given in the following drawing.



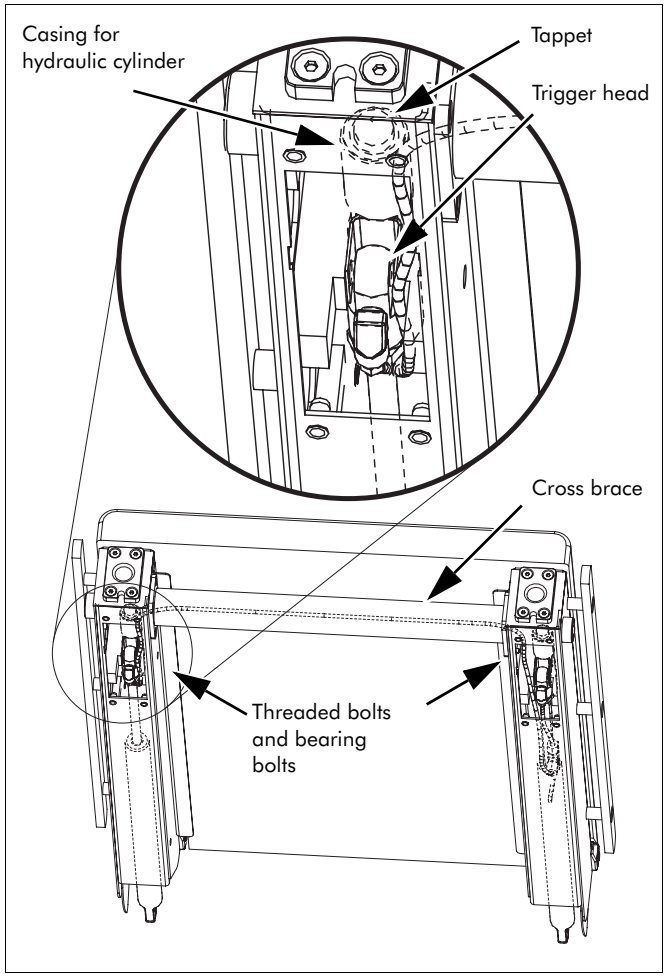
In an emergency it is also possible to use a long screw and a pair of pliers.

Preparation

- Fold the back section on top of the seat section. You will find details in the chapter “Folding the back section on top of the seat section” on page 29.

Removing the gas spring

The gas springs are fixed inside the frame of the back section. The bearing bolts with female thread are secured by means of headless screws.



- Detach the claddings together with the push handles at the underside of the back section.

- Loosen the headless screws above the bearing bolts at the inner side of the back section frame. The bearing bolts are now accessible.
- Start the upper and lower bearing bolts from the back section frame using the drift bolt.

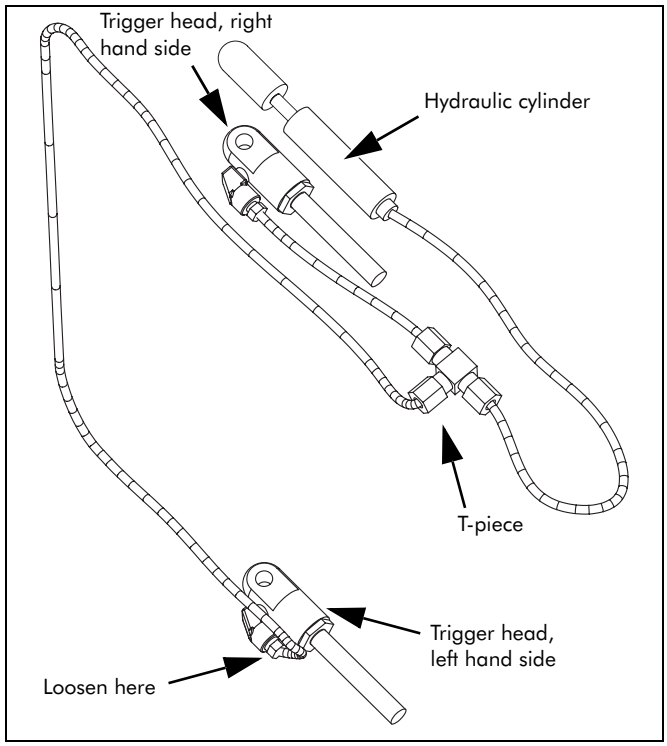
If there is no drift bolt at hand, use a screw and a pair of pliers.

The gas springs are now suspended loosely from the hydraulic hose inside the frame of the back section.

- If required, loosen the laces at the gas springs.
- Push the left or right hand gas spring up so that the locknut becomes accessible through the upper cut-out.
- Then loosen the locknut at the trigger head. In order to do so, block the trigger head by means of a screwdriver.
- Now turn the gas spring out of the trigger head and pull the gas spring down and out of the back section frame.

Replacing the hydraulic system

The hydraulic system for releasing the gas springs consists of a hydraulic cylinder with a hydraulic hose leading to a T piece. Two hydraulic hoses lead from the T piece to each of the trigger heads at the gas springs.



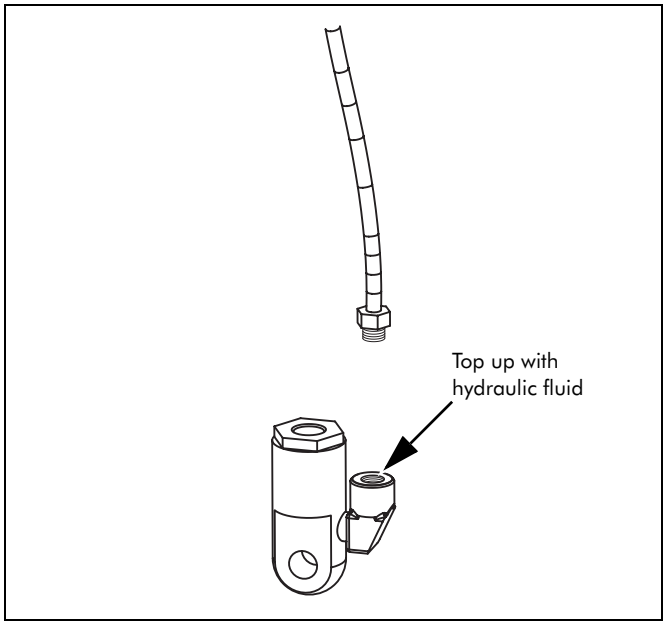
In order to replace the system proceed as follows:

- Remove the gas springs.
- Lift the hydraulic cylinder together with its casing out of the guiding at the right hand side of the frame using a pair of pliers.

The casing is fixed to the hydraulic cylinder by means of a circlip.

- Remove the circlip at the rear of the casing, remove the casing from the hydraulic cylinder and unscrew the compressor from the piston rod.
- Loosen the tube and pull it through the brace.

Attention!
It is important not to have air entrapped inside the system. As long as the system is opened the hydraulic cylinder must in no case be activated. Top up emerged hydraulic fluid immediately after pushing the trigger heads through the brace and close the system again.

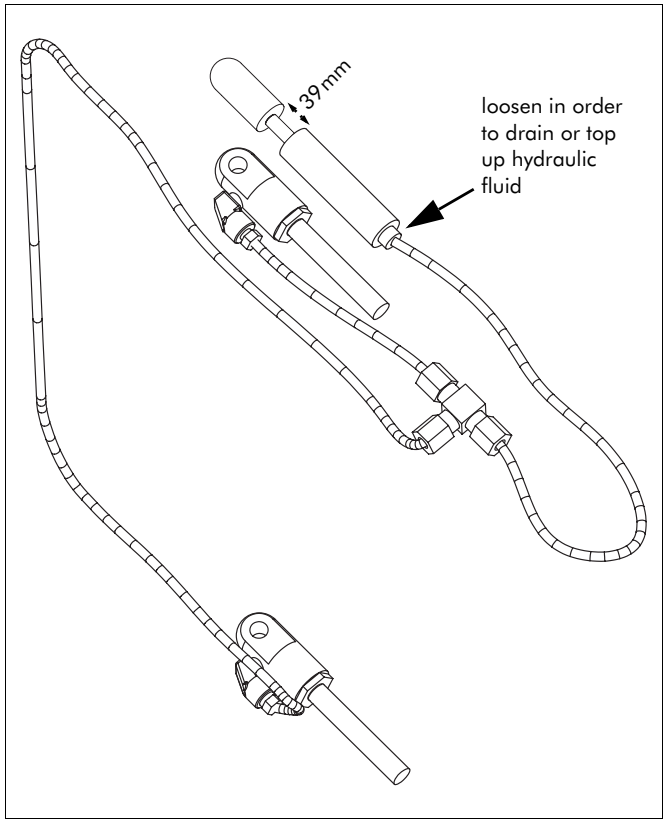


- Detach the hydraulic hose of the new system from the trigger head which is fixed to the longer hydraulic hose and push the hose through the cross brace.
- Fill the boring in the trigger head with hydraulic fluid using a syringe.
- In case hydraulic fluid has escaped, top up the hose completely with hydraulic fluid using a syringe. Tighten the screw joint; the screw has to touch the surface of the hydraulic fluid.

Adjusting the level of hydraulic fluid inside the hydraulic system

When the hydraulic system has been opened, it has to be topped up with hydraulic fluid afterwards. There is sufficient hydraulic fluid inside the system if the piston rod of the actuating cylinder is extracted by 39mm, while the cylinders inside the trigger heads are completely retracted.

The cylinders inside the trigger head are completely retracted when the trigger heads are screwed onto the gas springs. The actuating cylinder has to be extracted by 39mm. If the actuating cylinder is extracted by more than 39mm, loosen the screw joint of the actuating cylinder and let hydraulic fluid emerge.



- In order to drain hydraulic fluid from the system, loosen the screw joint at the actuating cylinder. Let hydraulic fluid emerge and re-tighten the screw joints of the system.

Screwing the compressor on

- Screw the compressor back on top of the piston rod (if required, secure it by means of screw locking varnish), push the casing over the hydraulic cylinder and insert the circlip at the rear of the casing.
- Lift the hydraulic cylinder together with its casing into the guiding.

Attention!
Observe the correct guiding of the hydraulic hoses. Activate the release mechanisms for the accessories and observe the movement of the hand lever for the back section adjustment, and of the longitudinal displacement function, if the table has got one.

Installing the gas spring

- Push the new gas spring from below into the frame of the back section, turn the gas spring in until the bolt touches the release button – you will note a higher resistance. Turn it back by half a turn and tighten the locknut.
- Drive the long bearing bolt from the inside of the back section frame through the trigger head. At the same time fix the casings of the hydraulic cylinders of the gas spring release (right hand side) and of the longitudinal displacement function (left hand side), if the table has got one.
- In the case of tables with longitudinal displacement function, fix the hoses of the release mechanism to the gas springs by means of laces.
- Drive the short bearing bolt from the inside of the seat section frame through the lower bearing eye of the gas spring.
- Screw the headless screws in.
- Refasten the release handle at the back section by means of the screws.

Final tasks

- Check the function of the gas springs and of the hydraulic release mechanism when the back section is charged with approx. 75kg (without the head plate).
- Make sure that the back section can be easily released and safely blocked.
- Screw the follower screws (M3) at the left and right hand sides of the safety sheet between seat and back section in.

Replacing the hydraulic cylinders for back section adjustment in the RC40 model

The back section of the RC40 model can be adjusted electro-hydraulically.

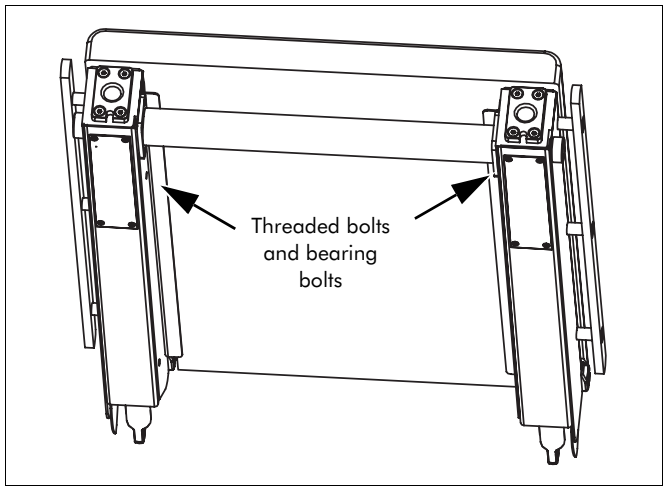
The hydraulic cylinders are installed in the LH and RH frame of the back section. The hydraulic cylinders are fixed to the frame by means of bearing bolts.

In order to drive the bearing bolts out you will require a drift bolt, which you can manufacture on site. You will find details in the chapter "Replacing the gas springs inside the back section, repairing the release mechanism" on page 31.

Preparation

- Fold the back section on top of the seat section. You will find details in the chapter "Folding the back section on top of the seat section" on page 29.

Removing the hydraulic cylinder



- Loosen the threaded bolts in front of the bearing bolts at the inner sides of the back section frame. Drive the bearing bolts out by means of a drift bolt.
- Make the hydraulic cylinder retract by means of the "lowering back section" function of the foot pump.
- In order to remove the hydraulic cylinders, drive the bearing bolts at the inner side of the back section frame out.

The hydraulic cylinders are now suspended loosely from the hydraulic hose at the back section frame.

- Loosen the hydraulic hoses from the piloted check valve and pull the hydraulic cylinder out.

Filling new hydraulic cylinders with oil and de-aerating them

The two new hydraulic cylinders for back section adjustment together with the hydraulic hoses have to be filled with oil.

- In order to fill the new hydraulic cylinder with hydraulic fluid, push the piston rod in completely and suspend them, hose connections pointing to the floor, from the corresponding bearing at the seat section frame.
- Connect the hydraulic hoses firmly to the piloted check valves. Connect the ends of the hoses loosely to the hydraulic, pulling the hoses slightly out of their bearing.
- Pump the hydraulic fluid carefully through the hoses to the hydraulic cylinders using the foot pump in "Raising back section" position. As soon as hydraulic fluid emerges from the loosened screw joints, tighten the screw joints. Then make the hydraulic cylinder extract completely.
- Loosen the screw joints at the hydraulic cylinder again, pulling the hoses slightly out of their bearing.
- Pump the hydraulic fluid in "Lowering back section" position carefully through the hoses to the hydraulic cylinders. As soon as hydraulic fluid emerges from the loosened screw joints, tighten the screw joints.
- Go on pumping carefully until the air has been discharged from the piston rod end and through the loosened screw joints. Retighten the loosened screw joints.
- Make the hydraulic cylinders retract completely.
- Adjust the hydraulic cylinders in such a way as to make the hose connections point to the ceiling. Repeat the procedure at the piston end of the hydraulic cylinder in order to de-aerate the system.
- Loosen the hoses at the piloted check valve and screw a stopper immediately onto the hoses.

The hydraulic cylinders are now de-aerated and can be installed.

Installing the hydraulic cylinders

- Install the hydraulic cylinders for back section adjustment in reverse order. Observe the different length of the bearing bolts.

Final works

- Check the functioning of the hydraulic cylinders.

Replacing the piloted check valve for back section adjustment in the RC40 model

The RC40 table model features a back section with electrohydraulic adjustment function. The piloted check valve is installed below the seat section pad, under the plastic cover of the top of the height adjustment column.

Preparation

- Detach the cladding of the height adjustment column. You will find details in the chapter “Removing and reattaching the cladding panels” on page 11.
- Make the back section lower completely.
- Disconnect the hydraulic systems of the upper and the lower table section. You will find details in the chapter “Disconnecting the hydraulic system between the upper section and the lower section for the kidney bridge and for the RC 40 model” on page 15.

Removing and installing the piloted check valve for back section adjustment

- As soon as the hydraulic hoses and tubes are detached from the check valve, screw the two fixing screws out.
- Replace the piloted check valve and screw the fixing screws back in.
- In order to de-aerate the valve, first of all connect the feeding hydraulic hoses at the bottom.
- Activate the foot pump carefully with the selector lever in “Raising back section” position until hydraulic fluid emerges from the opened screw joints. Screw the corresponding hydraulic hose tightly onto the joint. Repeat the procedure for the other hydraulic hose, in “Lowering back section” function.

You will find details in the chapter “Hydraulic diagram mobilis RC40” on page 82.

Longitudinal displacement function

The operating tables can be equipped with a longitudinal displacement function of the table-top. In that case the mounting of the seat section at the covering plate of the height adjustment column is not rigid but moving.

There are holders with an arbour at both cheeks of the seat section. The arbour slides inside a tubular bearing which is fixed to the covering plate of the height adjustment column.

In its initial state the longitudinal displacement function is locked. In this position the teeth of a stop panel are pressed into those of a rack by means of springs. The table-top cannot be displaced.

When the longitudinal displacement function is released a hand lever presses on a hydraulic cylinder. The pressure created is conducted via hydraulic hoses to two further cylinders, which press the stop panel back against the spring pressure via the relay arms.

We advise you urgently to read all chapters referring to the longitudinal displacement function before carrying out any kind of repair on this mechanism.

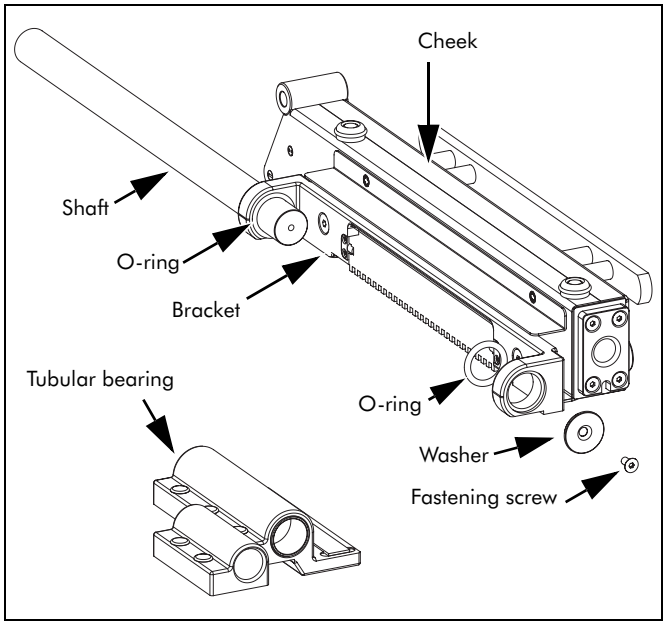
Detaching one side of the table-top from and re-attaching it to the column

Most kinds of repairs on the longitudinal adjustment mechanism can be carried out with the table-top remaining on top of the column. In this case, detach only one of the arbours. The table-top is retained by the remaining arbour during the repair.

Preparation

- Fold the back section on top of the seat section. You will find details in the chapter "Folding the back section on top of the seat section" on page 29.

Depending on the kind of repair, one of the brackets (long casting) has to be detached. You will find details in the chapter "Detaching the bracket" on page 42.



The arbour is retained inside the holder by means of flat washers at both ends.

- Screw the screws at the front of the two arbours out. The flat washer can now be removed and the arbor can be pulled out.

The fastening screws are secured by means of screw locking varnish. They have probably to be heated before they can be unscrewed.

- Carry out the repairs.
- Re-assemble the detached side of the table-top completely and, if required, repeat the procedure on the other side.

Replacing the stop panel

In its initial state the longitudinal displacement function is locked by means of the teeth of a stop panel interlocking with those of a rack. The stop panels can be replaced.

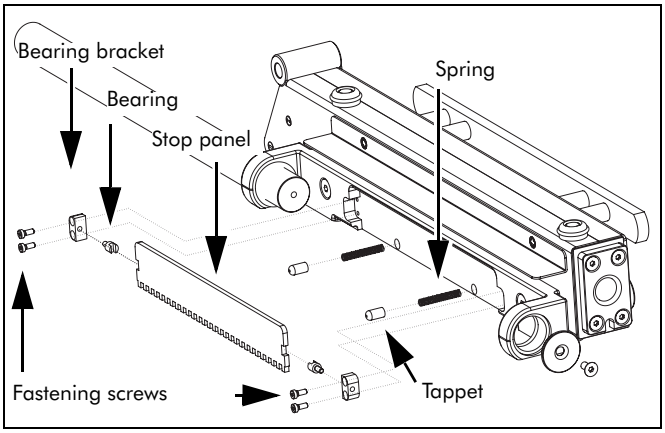
Preparation

- Remove the arbour on the respective side of the table-top. You will find details under "Detaching and re-attaching one side of the table-top" on page 39.

If you are working on your own, it may be helpful to fold the back section on top of the seat section. You will find details under "Replacing the gas springs, repairing the trigger mechanism" on page 31.

Removing the stop panel

The stop panel is fixed on both sides by means of bearing elements which rotate inside the bearing holder. The bearing holders are fixed to the mounting by means of two screws each.



- Unscrew the fastening screws from the bearing holders.
- Pull the stop panel, together with the bearing elements and the bearing holders, off the table-top. Mind the springs and the tappets, which are now loose.

Installing the stop panel

- In order to install a new stop panel, position the bearing elements together with the bearing holder next to the stop panel.

Mind the position of the groove in the bearing elements. The groove is off-centre. The stop panel is inserted in such a way that it protrudes from the holder.

- Insert the springs and the tappets into the borings and insert the stop panel with the bearing elements and the bearing holders into the recess and over the springs and tappets.
- Apply screw locking varnish to the fastening screws and finally screw the fastening screws into the bearing holders.

The fastening screws are secured by means of screw-lock varnish. Do not employ adhesive.

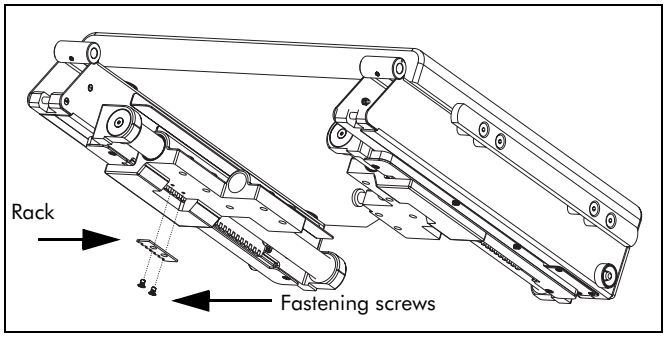
Final tasks

- Re-attach the table-top. You will find details under "Detaching and re-attaching one side of the table-top" on page 39.

Replacing the rack

The longitudinal displacement function is locked in its initial state by means of the teeth of a stop panel interlocking with those of a rack. The racks can be replaced.

The racks are fixed to the underside of the bearing tubes. They are accessible from the left or right hand side of the operating table. The table-top need not be detached.



Removing the rack

- In order to remove the rack, loosen the fastening screws and lift the rack out.

Installing the rack

The fastening screws for the racks are secured by means of screw locking varnish. Do not employ adhesive.

- In order to install the rack, apply screw locking varnish to the fastening screws and screw them in.

Repairing the relay arm for the stop panel

Preparation

- Remove the arbour on the respective side of the operating table. You will find details in the chapter “Detaching and re-attaching one side of the table-top” on page 39.

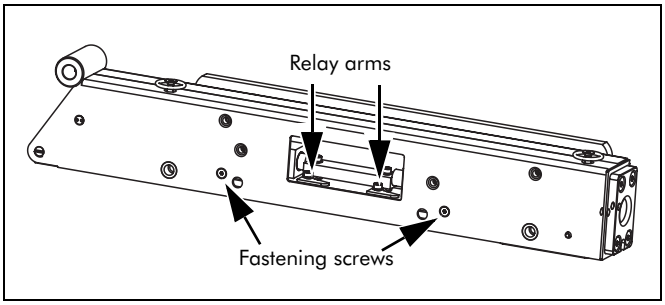
Removing the holder

- Loosen the slide rail at the underside of the holder by unscrewing the two fastening screws.
- Unscrew the four screws at the underside of the holder and the two screws at its inner side. Remove the holder from the cheek.

Removing the cassette slides and the cover panel

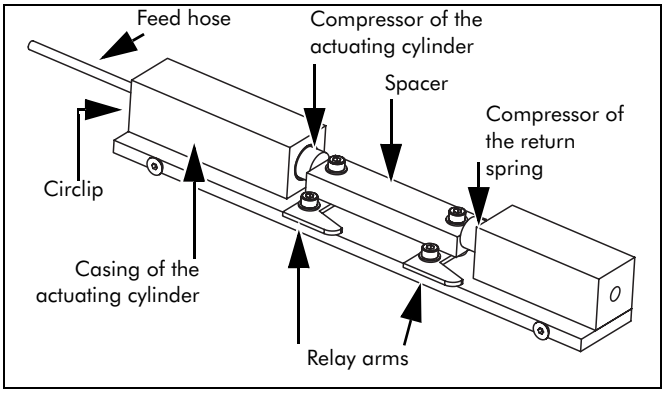
- Remove the cassette slide and the cover panel below the cassette slide from the inner side of the cheek.

Repairing the relay arms



The relay arms are now accessible, and worn parts can be replaced or loosened connections re-tightened. Re-assembly is carried out afterwards in reverse order.

Now you can loosen also the two holding screws and pull the complete release mechanism to the rear out of the cheek in order to carry out repairs. This is also necessary in order to replace the cylinders of the hydraulic release mechanism.



Installing the cassette slides and the cover panel

- Fasten the cover panel.
- Fasten the cassette slides.

Mounting the holder

- Position the holder at the cheek and screw the four screws at the underside and the two screws at the inner side of the cheek in.
- Fix the slide rail at the underside of the holder.

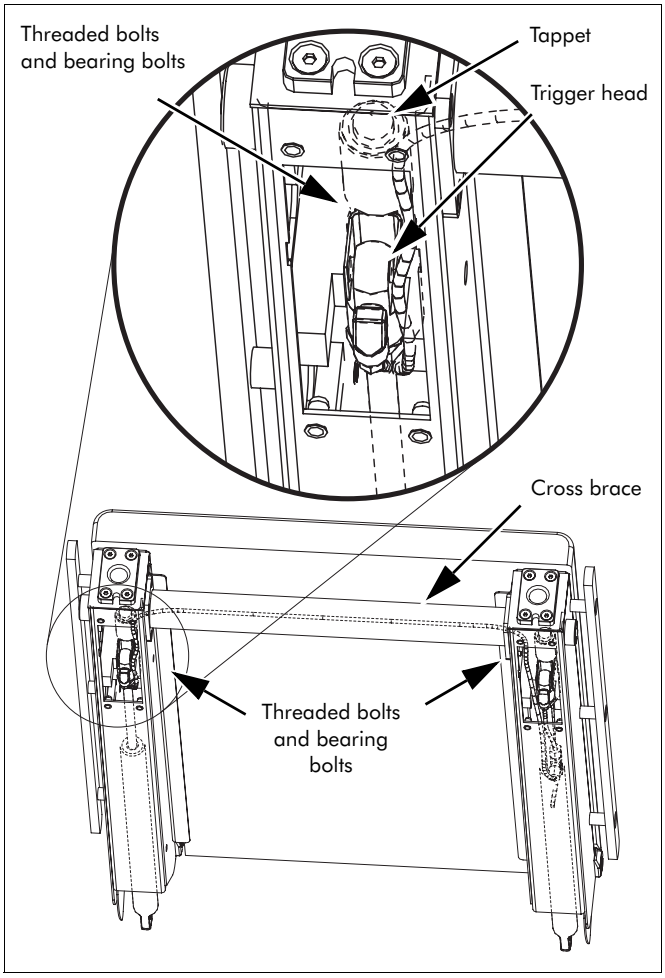
Repairing the release mechanism for longitudinal adjustment function

Preparation

- Fold the back section on top of the seat section. You will find details in the chapter “Folding the back section on top of the seat section” on page 29.

Removing the gas spring

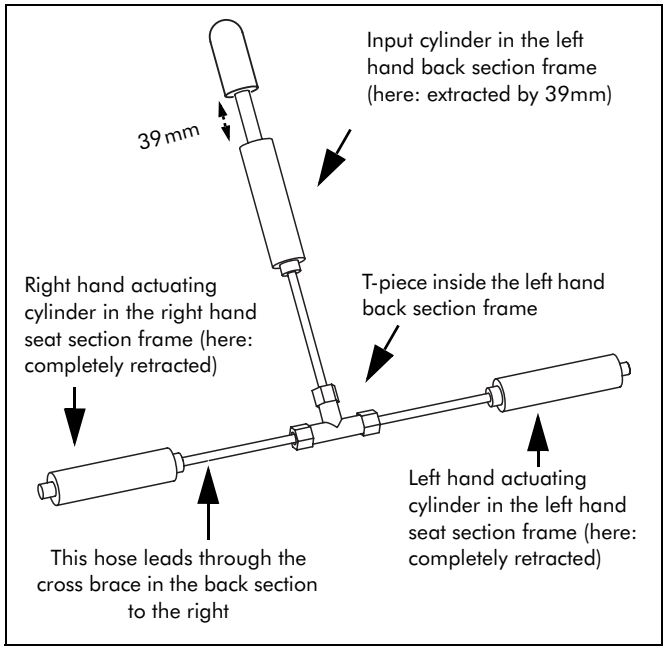
The gas springs are fixed by means of bearing bolts inside the frame of the back section. The bearing bolts with female thread are secured by means of headless screws.



- Remove the gas springs. You will find details in the chapter “Replacing the gas springs inside the back section, repairing the release mechanism” on page 31.

Repairing the hydraulic system

The release system of the longitudinal displacement function consists of three hydraulic cylinders which are connected by means of a T-piece.


Input cylinder in the left hand back section frame (here: extracted by 39mm)
39 mm
Right hand actuating cylinder in the right hand seat section frame (here: completely retracted)
T-piece inside the left hand back section frame
Left hand actuating cylinder in the left hand seat section frame (here: completely retracted)
This hose leads through the cross brace in the back section to the right

The release mechanism is a closed system. For its proper functioning a given quantity of hydraulic fluid is indispensable. When individual components or hoses have been replaced, following condition must be achieved:

1. There must be no air entrapped inside the system.
2. One of the cylinders has to be extracted by 39mm.
3. Two cylinders have to be retracted completely.

Replacing the input cylinder in the back section

The input cylinder in the back section is installed the same way as the input cylinder of the gas spring release mechanism, however, it is installed into the left hand back section frame.

Read the chapter referring to the gas spring release mechanism and to the gas springs before replacing the input cylinder. You will find details under "Replacing the gas springs at the back section and repairing the release mechanism" on page 31 and following.

In order to replace the input cylinder, proceed as follows:

- Remove the left hand handle together with the cover plate.
- Loosen the threaded bolt above the left hand upper bearing bolt. The bearing bolt is now accessible. Start the left hand upper bearing bolt.
- Pull the gas spring partly out of the back section.

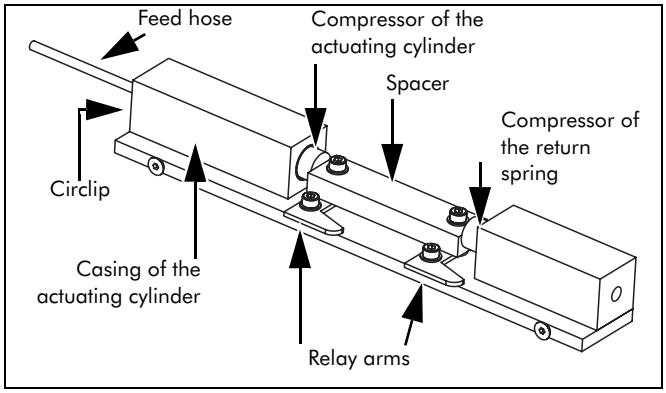
- Pull the casing together with the input cylinder out of the guiding.
- Detach the circlip at the rear inside the casing and pull the input cylinder out of the casing.

Make sure not to let air enter the hydraulic system when fastening the hoses. The screw joints have to dip into the hydraulic fluid.

Replacing the actuating cylinder

The actuating cylinders are installed at the seat section together with the relay arms and the return springs.

- Pull the complete assembly out of the cheek. You will find details under "Repairing the relay arm for the stop panel" on page 42.



In order to replace the actuating cylinder, proceed as follows:

- Detach the circlip at the rear of the casing of the actuating cylinder or the locking screws at the casing of the actuating cylinder.
- Pull the actuating cylinder out to the rear.
- The second actuating cylinder is completely retracted by means of the return spring. Make sure that the input cylinder is completely extracted before opening the system.
- Re-install the actuating cylinder into the casing and fix it by means of the circlip or by means of the locking screws at the casing of the actuating cylinder.
- Reassemble the complete system in reverse order.

Make sure not to let air enter the hydraulic system when fastening the hoses. The screw joints have to dip into the hydraulic fluid.

Attention!
Hydraulic hoses will not work properly if there are kinks inside. Make sure to install the hoses in such as way as to avoid their being kinked or squeezed.

Final tasks

- Check the function of the longitudinal displacement function. Make sure that it can easily be released. If releasing the longitudinal displacement function is difficult, there is probably too little hydraulic fluid inside the system. Check if there is a leakage in the system and, if so, repair it. Afterwards remove the actuating cylinder once more, top it up with hydraulic fluid and re-install it.

Replacing the bearing bushes and the sliding strips

Preparation

- Detach the corresponding side of the table-top. You will find details in the chapter “Detaching and re-attaching one side of the table-top” on page 39.

Replacing the sliding strips

At the upper surface of the bearing tubes there are sliding strips which are fixed by means of double-sided adhesive tape.

- Lift the old sliding strips by means of a sharp instrument, e. g. a screwdriver, and pull it off.
- Remove remainders of the adhesive tape and apply a new strip of adhesive tape.
- Lay in the new sliding strip, its bronze-coloured back facing downwards, onto the adhesive tape.

Replacing the bearing bushes

The bearing bushes are secured by means of screw locking varnish. Do not employ adhesive.

- Start the old bearing bushes and remove the remainders mechanically.

Attention!
The bearing bushes will deform when they are driven in by means of a hammer. Do not use a hammer, but push the bearing bush into the bearing tubes by hand.

- Apply screw locking varnish to the outside of the bearing bushes and push the bearing bush into the bearing tubes by hand.

Final tasks

- Fix the table-top. You will find details in the chapter “Detaching and re-attaching one side of the table-top” on page 39.

Table base

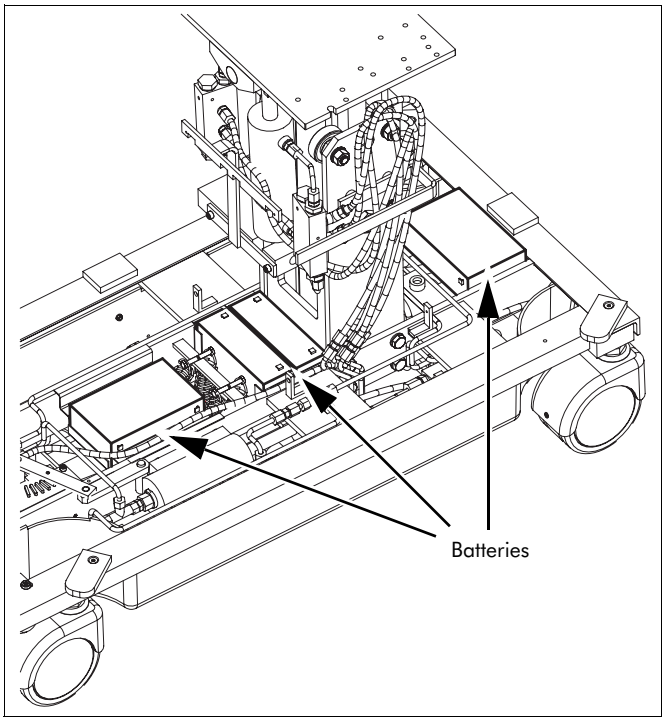
Replacing the batteries

The operating table models with an "E" in their type designation as well as the "RC" models are equipped with an electrically driven hydraulic pump. These operating tables are also equipped with four batteries connected in series inside the base. If required, the batteries can be replaced.

Preparation

- In order to replace the batteries, detach the cladding panels at the height adjustment column. You will find details under "Removing and re-attaching the cladding panels" on page 11.
- Lift off the cladding of the mobile base. You will find details under "Removing and re-attaching the cladding of the mobile base" on page 13.

Removing the old batteries



- Before replacing the batteries, switch the electro-hydraulic pump off at the main switch.
- Open the flexible clips securing the supply cables and lift the batteries off their supporting panels.

Inserting new batteries

Attention!
Batteries will get destroyed when they are connected in series in the wrong polarity. Always make sure to connect the batteries in the correct polarity.

- Break the heat-sealed joints at the cable lugs.
- Pull the cable lugs off the contacts marked in different colours at the old battery. Connect the cable lugs to the new battery in the same way as before.
- Replace all four batteries by new ones.
- Insert the batteries into the supporting panels and fix the supply cable by means of the flexible clips.
- Heat seal the cable lugs again.

Final tasks

- Check the function of the electro-hydraulic pump.
- Re-attach the cladding at the mobile base.
- Re-attach the cladding panels at the height adjustment column.

Replacing the reed board (not in the RC models)

Operating table models with an "E" in their type designation are equipped with an electrically-driven hydraulic pump. These operating tables are also equipped with a hand-held control unit indicating the preselected adjustment function by means of LEDs.

The LEDs are switched on or off by means of a permanent magnet at the lower end of a headless screw at the selector lever for the hydraulic switch valve. If the hydraulic switch valve is adjusted by means of the selector lever the magnet is moved over a board with magnetic switches (reed board) and the LEDs at the hand-held control unit indicate the preselected function.

You can see the set-up of the electronic system from the block diagram on page 74.

In case of a malfunction, proceed in the following order:

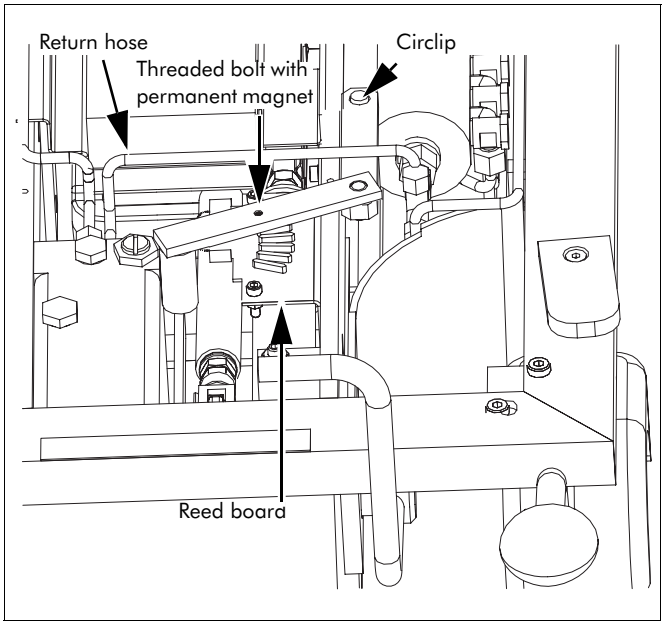
- Adjust the position of the magnet. You will find details under "Adjusting the reed board" on page 49.
- Replace the hand-held control unit,
- Check the cable connecting the reed board to the hand-held control unit,
- Check the cable leading from the control box to the hand-held control unit,
- Replace the reed board

The reed board can be replaced if required.

Preparation

- Before replacing the reed board, detach the cladding panels of the height adjustment column. You will find details under "Removing and re-attaching the cladding panels" on page 11.
- Lift off the cladding of the mobile base. You will find details under "Removing and re-attaching the cladding of the mobile base" on page 13.

Removing the reed board



The reed board is now accessible. It is secured to the holders by means of screws and 8 mm nuts.

- Loosen the fastening screws of the reed board by means of the appropriate tools.
- Lift the reed board off its holder.
- Loosen the fastening screws at the plug-and-socket connector and pull off the plugs.

The reed board is now detached and can be replaced by a new one.

Installing a reed board

Installation of a new reed board is carried out in reverse order.

- Insert the two plug-type connectors and screw the fastening screws in.
- Secure the reed board inside the oblong holes of the holder by means of the screws and the 8 mm nuts.

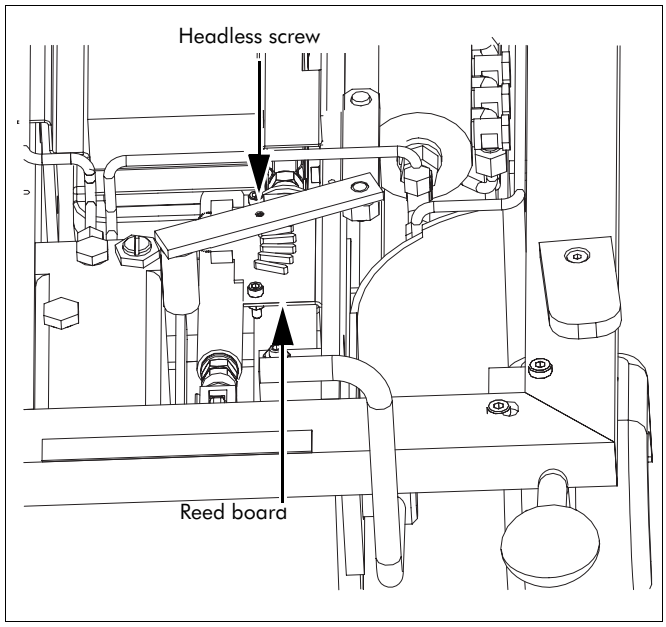
Adjusting the reed board

The reed board is installed into the oblong holes of the holder. If the LEDs on the hand-held control unit show a different function than the one preselected, the reed board can be adjusted inside the oblong holes until the LEDs show the correct function.

- In order to adjust the reed board inside the oblong holes, loosen the fastening screws and shift the reed board in lateral direction until the LEDs show the correct function.
- Finally secure the reed board by means of the screws and the 8 mm nuts.

If the selector lever with the permanent magnet has been lifted off its seat after installation, the reed board does not switch on. Make sure that the selector lever is positioned correctly above the reed board.

In case one or several of the LEDs do not light, the distance between the permanent magnet and the magnet switch can be diminished by turning the headless screw in.



- Turn the headless screw with the magnet in until all magnetic switches are switched on. The LEDs at the hand-held control unit will light one by one when the selector lever for the hydraulic switch valve is moved.

Final tasks

- Check the display of the hand-held control unit. If required, adjust the reed board as described before.
- Place the cladding back on top of the mobile base.
- Re-attach the cladding panels at the height adjustment column.

Piloted check valve for height adjustment cylinder

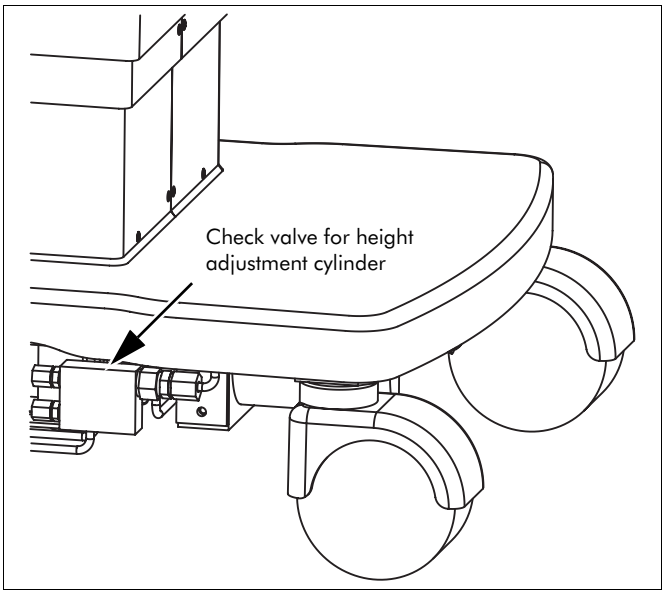
All operating tables are equipped with a piloted check valve for the height adjustment cylinder. There are three hydraulic connections in the model types mobilis 200 to mobilis 300 and four hydraulic connections in the RC models.

The piloted check valve for the height adjustment cylinder can be replaced.

Preparation

- In order to replace the piloted check valve, detach the cladding panels of the height adjustment column. You will find details in the chapter “Detaching and re-attaching the cladding panels” on page 11.
- Lift the cladding off the mobile base. You will find details in the chapter “Removing and re-attaching the cladding of the mobile base” on page13.
- Detach the actuating rod. Detach the floor pan. You will find details in the chapter “Replacing or lowering the floor pan” on page 14.

Removing and installing the check valve for the height adjustment cylinder



- Lower the table-top into minimum height.
- Loosen all screw joints at the check valve.
- Insert the new check valve into its place and screw the hydraulic hoses on.
- In order to de-aerate the system, raise and lower the table-top completely 2 to 3 times.

Removing and re-installing the control box of mobilis 300 E tables

The operating table models with an “E” in their type designation are equipped with an electrically driven hydraulic pump. These operating tables are also equipped with a control box with a socket for the recharging unit and a main switch.

The control box is equipped with fuses which can be replaced if required (see operating instructions).

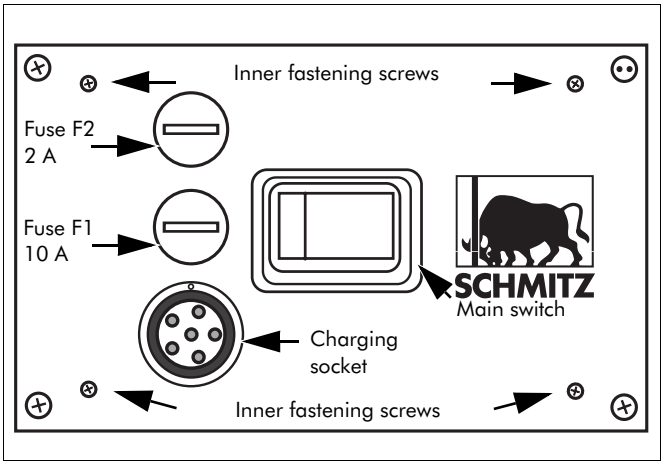
In case of a malfunction, always check the fuse first.

Preparation

- In order to remove the control box, detach the cladding panels at the height adjustment column. You will find details under “Removing and re-attaching the cladding panels” on page 11.
- Lift the cladding off the mobile base. You will find details under “Removing and re-attaching the cladding of the mobile base” on page 13.

Removing the control box

The control box is fixed to the side of the floor pan by means of four screws. The outer fastening screws are secured to the rear of the control box by means of nuts. An earthing cable, which can only be detached from the rear, is connected to one of the fastening screws.



- Switch the main switch OFF.
- Loosen the four outer fastening screws at the front panel and pull the control box forward and out of the floor pan.
- Detach the cable of the motor from the terminal in front of the height adjustment column.
- Loosen the plug-type connection at the reed board and remove this cable.
- Loosen the sleeve nut at the socket for the hand-held control unit at the top of the column.
- If there is a cable clip underneath the cover of the height adjustment column, detach it.
- Remove the cable for the hand-held control unit.
- Pull the control box together with the cables out of the floor pan.

Installing a control box

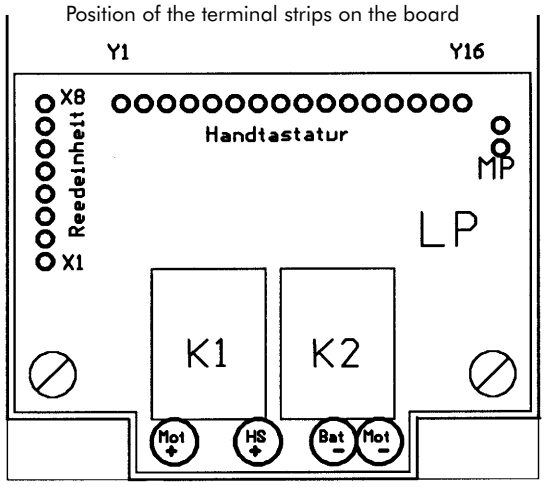
A new control box can be installed in reverse order.

- Push the control box from the front through the cut-out in the floor pan.
- Screw the four outer fastening screws in.
- Secure the supply cable by means of the adhesive clips.

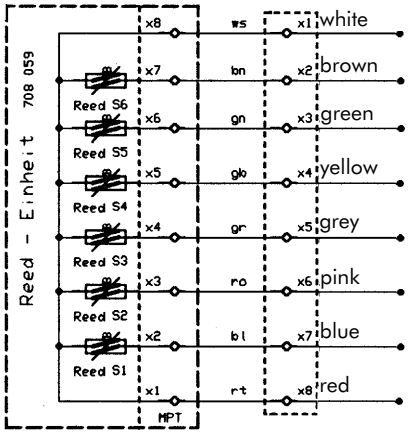
Attention!
Make sure that all cables are installed in exactly the same way as before the replacement of the control box. It is especially important that the cable of the hand-held control unit has got sufficient slackness during all adjustment positions of the height adjustment column.

It is also possible to replace the control box without replacing the cables for the reed board and for the hand-held control unit. In order to do so, loosen the inner fastening screws at the control box and open the box. Inside you will find the terminals for these cables. Please refer to the following terminal diagram.

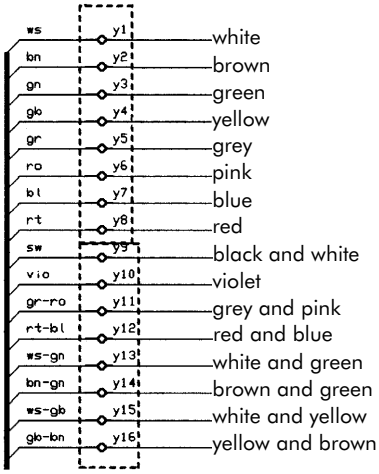
Position of the terminal strips on the board



Assignment of the cables on the terminal strips



Cable leading to the socket for the hand-held control unit



Final tasks

- Check the functions of the electro-hydraulic pump.
- Place the cladding back on top of the mobile base.
- Re-attach the cladding panels at the height adjustment column.

Removing and re-installing the control box of the mobilis RC tables

The RC operating table models are controlled by a control box. The control box is equipped with fuses which can be replaced if required (see operating manual).

In case of a functional disorder, check the fuses first.

Preparation

- In order to remove the control box, detach the cladding panels of the height adjustment column. You will find details under “Removing and re-attaching the cladding panels” on page 11.
- Lift off the cladding of the mobile base. You will find details under “Removing and re-attaching the cladding of the mobile base” on page 13.
- Pull the bolt lock off the bolts at the actuating rod and then pull the actuating rods off to the outside.

Removing the control box

The control box is fixed to the side of the floor pan by means of five screws. There is an earthing cable at one of the fixing screws which can be detached from the rear.

- Switch the main switch off.
- Loosen the five outer fixing screws at the front panel and pull the control box out of the floor pan.
- Detach the white plug-type connector for the motor and the black plug-type connector for the batteries.
- Loosen the plugs for the hand-held control unit, for the magnetic valve and for the sensors at the back of the control box.

Installing the control box

A new control box can be installed in reverse order.

The control box has got a slot at its back wall. A slide switch, which is accessible through this slot, serves to adjust the control unit either for the RC30 version or for the RC40 version.

- Adjust the control unit for the required model variant and seal the slot afterwards.
- Connect all plug-type connectors.
- Push the control box from the front through the cut-out in the floor pan.
- Screw the five outer fastening screws in.

Attention!
Take care to install the cables exactly the same way as before the replacement. It is especially important that the cable of the hand-held control unit has got sufficient slackness during all adjustment positions of the height adjustment column.

Final tasks

- Check the functions of the remote control unit.
- Position bolts of the actuating rod inside the brackets and secure the bolts by means of the bolt locks.
- Re-attach the cladding panels at the mobile base.
- Re-attach the cladding panels to the height adjustment column.

Adjusting the directional castor

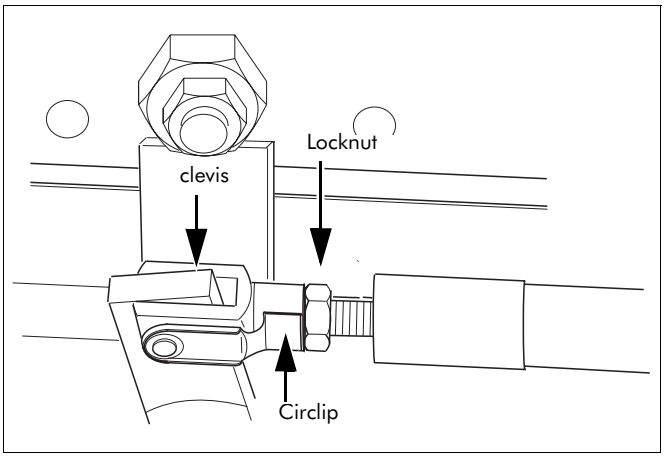
The operating tables with a "C" in their type designation are equipped with an add-on directional castor. The directional castor can be adjusted.

Preparation

- In order to adjust the directional castor, detach the cladding panels of the height adjustment column. You will find details under "Removing and re-attaching the cladding panels" on page 11.
- Lift off the claddings of the mobile base. You will find details under "Removing and re-attaching the cladding of the mobile base" on page 13.
- Lift the control lever for the hydraulic switch valve off.

Detaching the clevis

The directional castor is connected to the foot lever by means of a tie rod. A clevis secured by means of a locknut is screwed to the end of the tie rod. The contact pressure of the directional castor can be raised by extending the tie rod.



- In order to detach the clevis, loosen the locknut of the clevis, detach the circlip of the bolt and pull the bolt out of the clevis and out of the bearing eye.
- Pull the clevis off the bearing eye.

Adjusting the contact pressure of the directional castor

In order to raise the contact pressure of the directional castor, the tie rod has to be extended. In order to reduce the contact pressure of the directional castor, the tie rod has to be shortened.

- Extend or shorten the tie rod by turning the clevis on its thread to the left or to the right.

Fixing the clevis

- Now, place the clevis back over the bearing eye, re-insert the bolt and secure the bolt by means of the circlip.
- Tighten the locknut at the clevis.

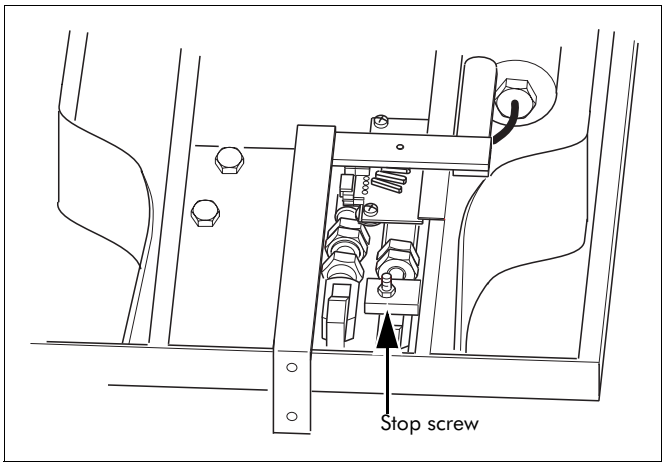
Final tasks

- Check the contact pressure of the directional castor.
- Install the selector lever for the hydraulic switch valve.
- Place the cladding back onto the mobile base.
- Re-attach the cladding panels at the height adjustment column.

Adjusting the dead centre of the pedal for the brake and for the directional castor

In order to adjust the top dead centre of the pedal for the brake and for the directional castor, turn the adjusting screw.

If the adjusting screw is not screwed out sufficiently, the brake can come loose unintentionally in case of a shock.



Screwing the adjusting screw in will facilitate loosening the brake, while screwing the adjusting screw out will make it more difficult to loosen the brake.

- In order to adjust the dead centre of the brake, turn the stop screw in or out using an Allan key.
- Make sure that the brake resists to shocks without coming loose unintentionally.

Final tasks

- Make sure that the brake resists to shocks without coming loose unintentionally.
- Reinstall the floor pan.
- Place the cladding back on top of the mobile base.
- Re-attach the cladding panels at the height adjustment column.

Replacing the hydraulic switch valve

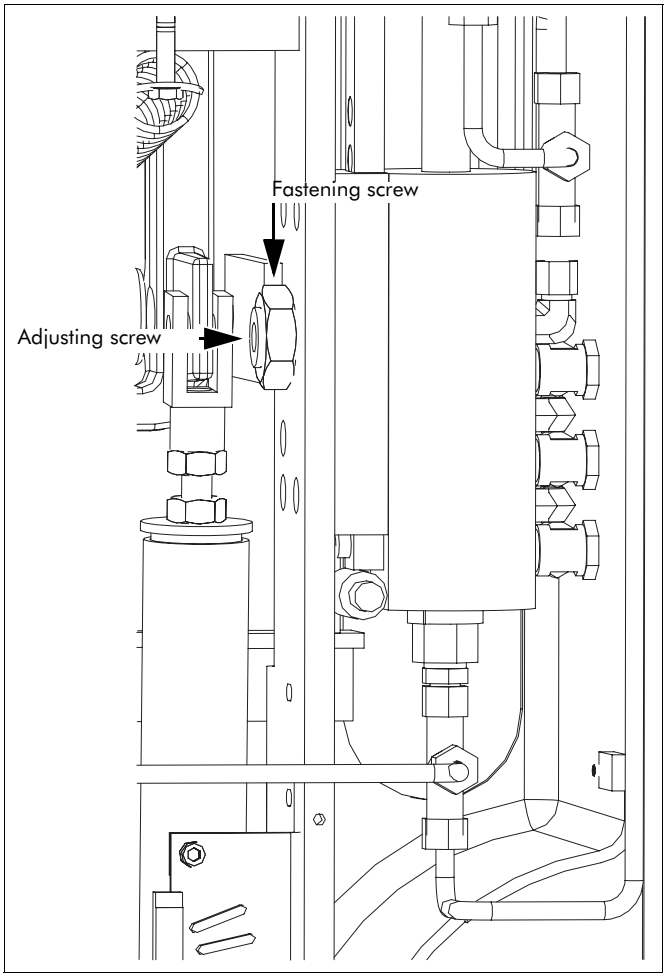
All operating table models can be adjusted hydraulically. They can be adjusted by means of either the foot pump or the electro-hydraulic pump. The individual adjustment functions are preselected by means of a hydraulic switch valve. The hydraulic switch valve can be replaced.

Preparation

- In order to replace the hydraulic switch valve, detach the cladding panels of the height adjustment column. You will find details under "Removing and re-attaching the cladding panels" on page 11.
- Lift off the claddings of the mobile base. You will find details under "Removing and re-attaching the cladding of the mobile base" on page 13.
- Remove the floor pan. You will find details under "Replacing or lowering the floor pan" on page 14.

Removing the hydraulic switch valve

The hydraulic switch valve is fixed to the frame of the mobile base.



- In order to remove the switch valve, lower the table-top to minimum height.
- Detach all hydraulic tubes including the pressure line together with the hydraulic filter and the return hose. Detach each of the hydraulic tubes directly at the switch valve.

For RC models: Detach also the hydraulic hoses from the magnetic valve on top of the switchover valve.

- Lift the detached hydraulic tubes of the RC models.
- Lift the three batteries behind the hydraulic switch valve together with the mounting panel out.
- Loosen the fixing nut of the hydraulic switch valve by means of a 32 mm open-end spanner.

- Pull the switch valve out.

Installing a hydraulic switch valve

A new hydraulic switch valve can be installed in reverse order.

- Put the hydraulic switch valve into position, fasten it by means of a torque wrench at 10Nm. Then align it in horizontal position.
- Place the three batteries together with their mounting panel back into their position.
- For RC models: Screw the hydraulic tubes of the magnetic valve on top of the new switch valve. Connect the pressure hose and the return hose with the hydraulic switch valve. Do not yet attach the hoses leading to the cylinders at the side of the switch valve.

De-aerating

In order to de-aerate the new switch valve, the hydraulic hoses leading to the cylinders must not yet be attached.

In order to de-aerate the system, pump hydraulic fluid through the switch valve by means of the foot pump or, in the RC models, also with the aid of the hand-held control unit, activating the different functions until no more air escapes from the system.

- Make the selector lever swivel up to its left hand end-stop. The function “Height adjustment up” is now preselected.
- For RC models: pump hydraulic fluid through the switch valve using the hand-held control unit first, until the air has escaped from the first screw joint.
- Then use the foot pump to pump hydraulic fluid through the switch valve until the air has escaped from the first screw joint.
- Tighten the first screw joint. The first hydraulic chamber is now de-aerated.
- Raise the table-top into maximum position. Then swivel the selector lever into “Lowering table-top” position.
- Make hydraulic fluid flow through the switch valve by means of the foot pump until the air inside has escaped through the second screw joint.
- Tighten the screw joint. The second hydraulic chamber is now de-aerated.
- Swivel the selector lever swivel into the next position.
- Pump hydraulic fluid through the switch valve, first by means of the hand-held control unit in the case of RC models, and then by means of the foot pump until the air has escaped through the relative screw joint. Tighten the screw joint.
- Repeat the procedure for all the table functions.

Adjusting the snap-in locking

The switch valve engages at each function. The snap-in locking can be adjusted by means of the adjusting screw secured by means of a locknut.

- Loosen the locknut, screw the adjustment screw in or out as required and retighten the locknut afterwards.

Final tasks

- Check the function of the hydraulic switch valve.
- Reinstall the floor pan.
- Place the cladding back on top of the mobile base.
- Re-attach the cladding panels at the height adjustment column.

Replacing double castors

The operating tables are equipped with four electrically conductive double castors. The double castors can be replaced.

Preparation

- In order to replace one of the double castors, remove the cladding panels at the height adjustment column. You will find details in the chapter “Removing and re-attaching the cladding panels” on page 11.
- Lift the cladding off the mobile base. You will find details in the chapter “Removing and re-attaching the cladding of the mobile base13

Dismounting the double castors

In order to dismount one of the double castors, loosen the hexagonal shaft between the double castors.

- Loosen all the Allen screws at the components on the hexagonal shaft, so that the hexagonal shaft can be moved to the left or to the right inside its bearing.
- Swivel the pedal for the brake and for the directional castor into mid-position and drive the hexagonal shaft of the double castor out.
- Loosen the fastening screw at the bearing; lift the table up and pull the double castor down and off.

Caution!
Once one of the castors has been removed, the table may tilt and thus cause injuries. Make sure to prop the operating table carefully up.

- Prop the operating table up.

Installing the double castors

The locking direction of the new double castor is indicated by means of a sticker. Install the new double castor in mid-position and the direction of locking pointing away from the pedal end of the table.

- Mark the locking direction of the double castor and bring the new castor into mid-position by means of a spanner for hexagon nuts.
- Push the new double castor into the holder in such a way as to make its locking direction point away from the pedal end of the table.
- Screw the fixing screw at the holder in; push the hexagonal shaft through and fasten all the components to the hexagonal shaft.

Final tasks

- Make sure that the brake and the directional castor work correctly.
- Place the cladding back on top of the mobile base.
- Re-attach the cladding panels of the height adjustment column.

Replacing the electro-hydraulic pump

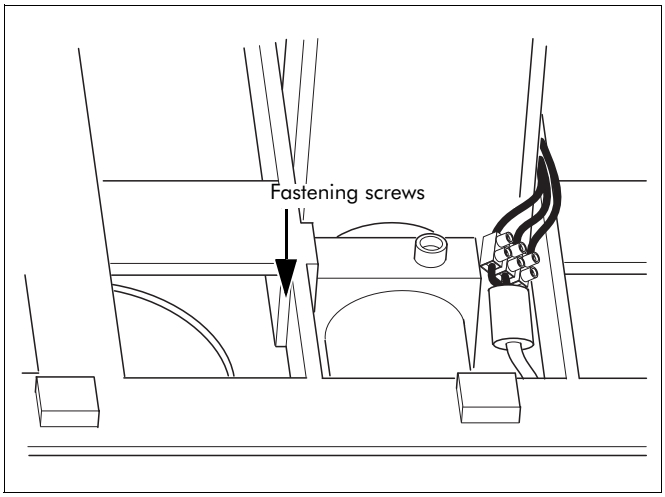
Operating tables with an "E" in their type designation are equipped with an electrically-driven hydraulic pump. The electro-hydraulic pump can be replaced if required.

Preparation

- In order to replace the electro-hydraulic pump, detach the cladding panels of the height adjustment column. You will find details under "Removing and re-attaching the cladding panels" on page 11.
- Lift off the claddings of the mobile base. You will find details under "Removing and re-attaching the cladding of the mobile base" on page 13.
- Remove the floor pan. You will find details under "Replacing or lowering the floor pan" on page 14.

Removing the electro-hydraulic pump

The electro-hydraulic pump is fixed to the front inside the frame of the mobile base. It is connected to the suction hose, to the pressure hose and to the tank hose by means of banjo bolts.



- In order to remove the electro-hydraulic pump, switch the main switch OFF, detach the electric connections at the lamp-wire connector.
- Loosen the bolt fastenings at the pressure hose, and the hose clamps at the tank hose and at the suction hose.
- Loosen the fastening screws at the right hand side of the frame and detach the electro-hydraulic pump pulling it sideways and downwards.

Installing an electro-hydraulic pump

A new electro-hydraulic pump can be installed in reverse order.

- Put the electro-hydraulic pump into position. Fasten it to the right hand side of the frame by means of the fastening screws. Tighten the fastening screws using a torque wrench at 10 Nm.
- Screw on the pressure hose and connect the tank hose and the suction hose by means of the hose clamps.
- Connect the electric cables to the lamp-wire connector.

Final tasks

- Check the function of the electro-hydraulic pump.
- Re-install the floor pan.
- Place the cladding back on top of the mobile base.
- Re-attach the cladding panels at the height adjustment column.

Electrical safety

After the repairs, the design-related and functional features essential for the safety of the appliance must be checked, insofar as they may be affected by the repairs.

After modifications which may alter the safety characteristics of the appliance, the corresponding check-ups of the resistance of the protective conductor and of the equivalent of the leakage current have to be carried out.

The individual checks allow in general the evaluation of the status of the electrical safety.

After repairs or modifications which may influence the normal operation as to the input/output values of the appliance, or currents inside the equipment, these values must be measured additionally and, if need be, readjusted.

Repairs, modifications or tests may involve electrical or mechanical risks for patients or operators. Therefore, patients or users should not stay in the dangerous area of the appliance while the above-mentioned operations are being carried out.

For the protection of the inspector, following tests should be carried out in the stated order.

The test values stated below are in accordance with the German VDE 0751/part 1 standard.

Carrying out the measurements

The appliances have to be connected to the measuring units according to the measurements to be carried out and according to the circuit diagrams.

Lines which establish the contact to the equipment under test have to be guided in a distance of at least 200 mm from the enclosure of the equipment under test. Switches in the mains part have to be closed as during normal operation while the measuring procedures are being carried out, in order to register the resistance of all insulations of the mains part during the measurement.

Initially measured value

In case of new appliances, or of appliances which have not yet been tested, the so-called initially measured value has to be determined, if possible before any repair is carried out. This value has to be recorded in writing as a comparison value for future measurements of the equivalent of the leakage current. The appliances may only be operated further, if the measured value is lower than the indicated limit value.

Repeated measurements

The values determined in the repeated measurements must not exceed the indicated limit values. Additionally, the initially measured value must not be exceeded by more than 10 μA or 50% respectively, depending on which value is higher. Higher values give a reason to suspect inadmissible modifications. Such appliances are to be returned to the manufacturer.

Documentation and evaluation of the tests

The results of the tests must be recorded in writing. For their documentation, the table at the end of these instructions may be filled in. For perpetual completion of the table, please enclose it in the operating manual, so that it stays with the operating table.

If safety is not assured, e.g. because

- repairs are impossible
- the testings failed or
- the user does not want to have the necessary repairs done,

the user must be informed in written form about the danger which the appliance is constituting.

Visual inspection

Before the following tests concerning the protective measures against an excessive shock hazard voltage can be carried out, repaired or modified appliances must be visually checked for externally or internally recognizable defects, as far as these become visible during the intervention; this applies especially to the protective conductor and its connection points. After that, the appliances are closed, if they need not remain open for the tests. After the assembly, all mechanical parts which have been removed during the repairs must be visually checked for being duly fastened, all moving parts, for their mobility, and all supporting parts, for possible damage. In the evaluation of the safety status of appliances, it should particularly be taken care, that

- the fuse links are corresponding to the values indicated by the manufacturer,
- the safety-relevant marks on the appliance are legible,
- the mechanical condition allows further safe operation, and that
- there are no soilings affecting the safety.

Measuring the resistance of the protective conductor

A current of a minimum of 5 A and of a maximum of 25 A flows from a power supply with an off-load voltage of a maximum of 6 V to the protective conductor section which is to be measured. The resistance depends on the current and the voltage drop at this section of the protective conductor. The measuring instruments must at least meet the requirement of the class 2,5.

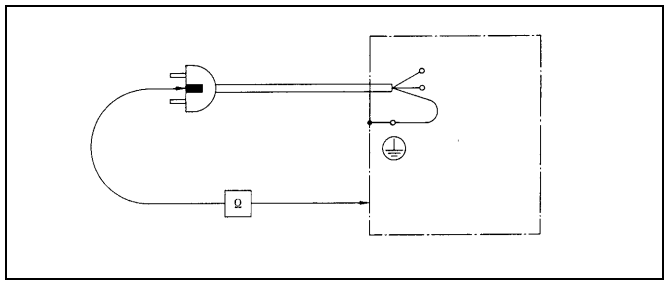
Ohmmeters according to German VDE 0413, part 4, may be used, if the measuring is carried out with alternating voltage.

Move the mains cables for at least 5 s during the measurement. The resistance must not fluctuate during that time.

If resistance fluctuations occur, it must be supposed, that the protective conductor is damaged or that the connection points are no longer perfect.

Appliances with mains cable

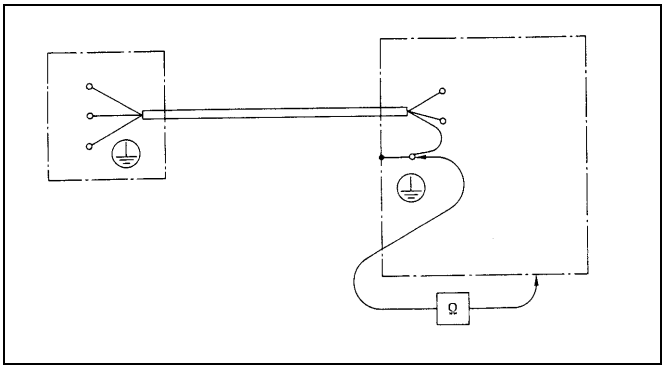
The resistance between the accessible conductive parts of the appliances, which can assume a dangerous electric voltage in the case of a malfunction, and the connections of the protective conductor is measured. For appliances with mains cable, the resistance between the contact pins of the mains plug and the accessible parts of the appliance must not exceed 0.2 Ω.



Measuring the resistance of the protective conductor of appliances with mains lead

Hard-wired appliances

For hard-wired appliances, the resistance between the terminal of the protective conductor of the appliance on the one hand and its accessible conductive parts on the other hand, which can assume a dangerous shock hazard voltage in case of a malfunction, must not be higher than 0.2 Ω. The existing protective conductor is not disconnected during the test.



Measuring the resistance of the protective conductor of hard-wired appliances

Disconnecting and reconnecting a protective conductor repeatedly will involve a deterioration of its mechanical and electrical values. In addition, the danger of forgetting to reconnect the protective conductor will increase. A possible influence on the measuring values by incidental connections to earth is acceptable.

Measuring the equivalent of the leakage current to ground

Measuring the leakage current on site is either impossible or requires special effort. Normally, the measurement of the equivalent of the leakage current is sufficient after repairs to and modifications of appliances connected to the mains by means of mains cable and plug.

Measurement of the equivalent of the leakage current produces measured values which are not directly comparable with the leakage current values according to the definitions for type tests.

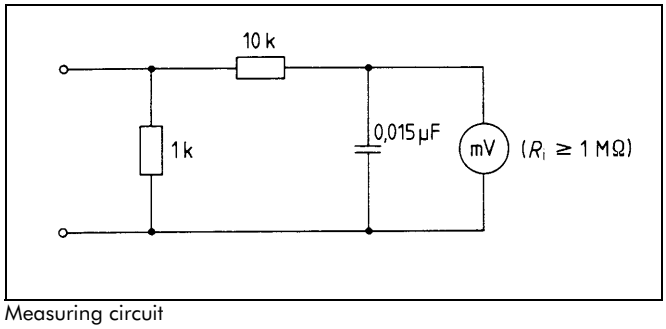
The purpose of repeated measurements of the equivalent of the leakage current is to recognize as soon as possible any deviations from the so-called initially measured value and thereby, modifications of the safety structure of the appliance.

These measurements may only be carried out by skilled personnel, as during the measuring procedure of the leakage current, protective measures, e. g. the protective conductor, may be ineffective.

Measuring circuit

The measuring circuit consists of the actual measuring device and an external circuitry. Observing the following requirements, the circuit for measurement must be appropriate to measure alternating currents between 10 μA and 10 mA.

The actual measuring device must display r.m.s. voltage of sinusoidal alternating current; an input resistance of ≥ 1 MΩ, and the error of measurement, basing on the accumulated range value, must not exceed 5% in the frequency range of 20 Hz to 1000 Hz.

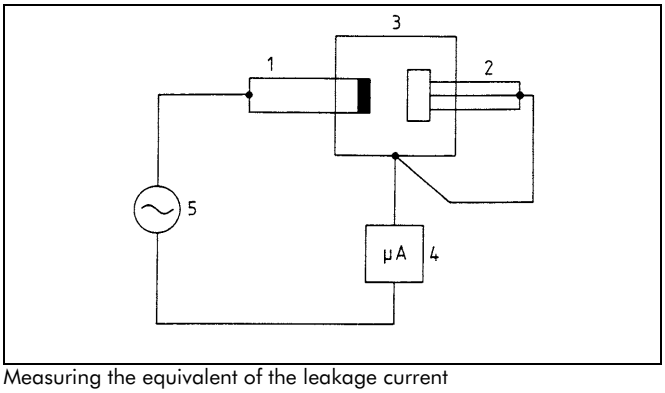


Measuring circuit

Appliances with mains cable

The pins of the mains plug, which are temporarily connected to be conductive (except earthing pin plugs), as well as accessible metal parts of the enclosure are connected with the measuring device according to the following diagram.

The maximum values for the equivalent of the leakage current amount to 1 mA for appliances with mains cable.



Measuring the equivalent of the leakage current

1. Unit connecting
2. Applied part (e.g. accessible surfaces of accessories)
3. Accessible conductive parts
   (enclosure of the appliance)
4. Measuring circuit
5. Mains frequent measuring voltage source

SCHMITZ

Designation of the appliance:
Type/production number:
Inventory number:

Testing authority	Name	Date	Kind of testing	Results	Signature of the inspector
Initially measured value					
Repeated measurements					

Designation of the appliance:
Type/production number:
Inventory number:

Testing authority	Name	Date	Kind of testing	Results	Signature of the inspector

Technical data

Measurements/weights/electrical data

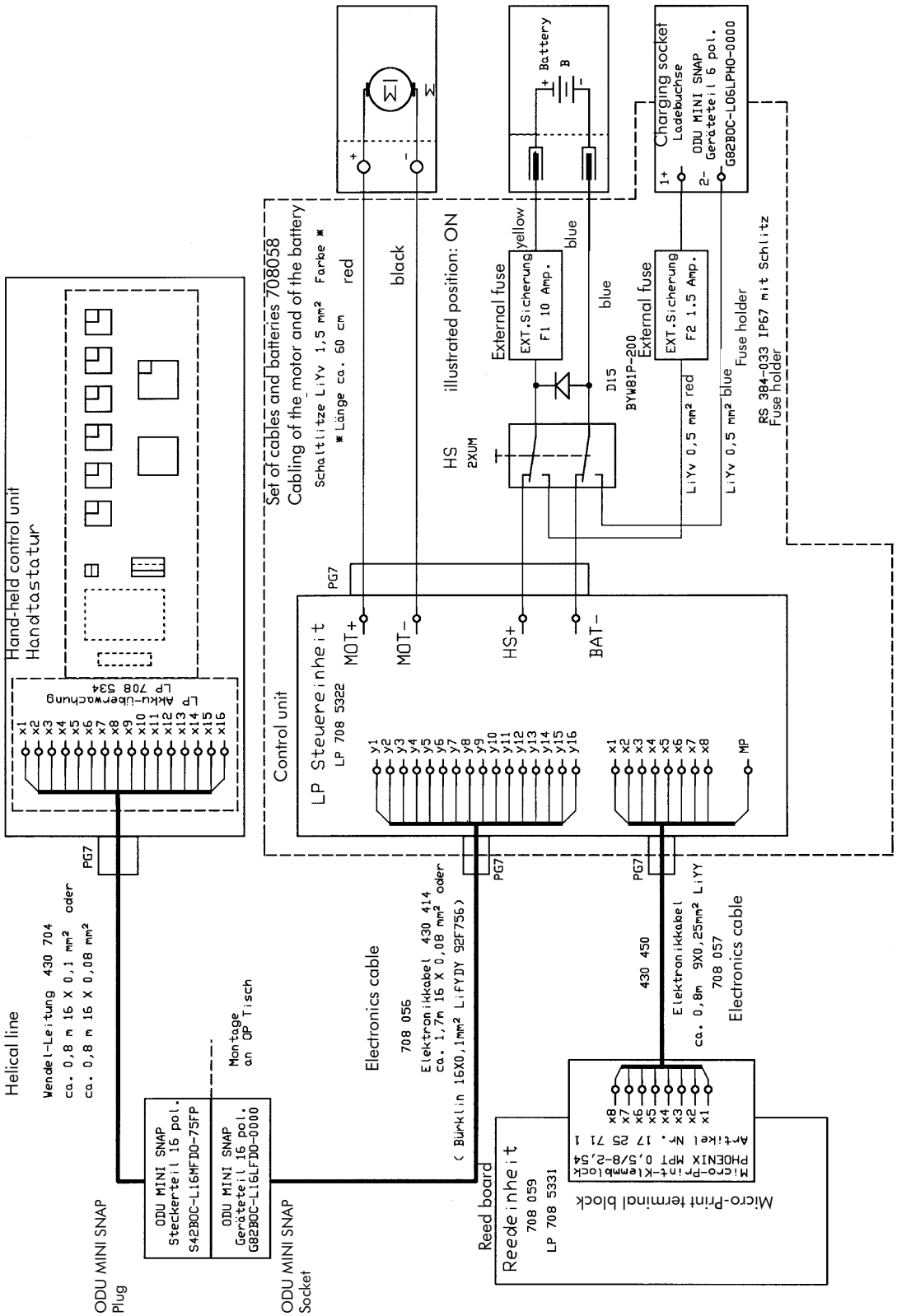
	OPX mobilis							
	200	**300 C**	**300 CL**	**300 CE**	**300 CLE**	**RC30 RC30/G**	**RC30L RC30L/G**	**RC40 RC40/G**
Total length w/o head plate	1,780mm							
Total length incl. head plate	2,130mm							
Width of table-top	540mm							
Total width	590mm							
Floor plate (length x width)	1,022mm × 572mm					1,120mm × 580 mm		
Diameter of swivel-type castors	125mm							
Height adjustment range	720mm to 1,080mm	720mm to 1,080mm	740mm to 1,100mm	720mm to 1,080mm	740mm to 1,100mm	720mm to 1,080mm	740mm to 1,100mm	720mm to 1,080 mm
Trendelenburg adjustment	30°							
Reverse Trendelenburg adjustment	30°							
Lateral adjustment both sides	—	±20°						
Longitudinal displacement of the table-top	—	—	250mm (2× 125mm)	—	250mm (2× 125mm)		250mm (2× 125mm)	
Back section adjustment	+70°/-50°							
Leg plate inclination	+20°/-90°							
Leg plate spread angle	—	45°						
Head plate inclination totally	+25° to 45°							
Setting angle of head plate pad	—	25°						
Weight	160kg	180kg	190kg	200kg	210kg	210kg	220kg	215kg
Nominal charge	135kg/185kg							185kg/225kg
Pressure rating of the hydraulic system	120bar							

Measurements/weights/electrical data

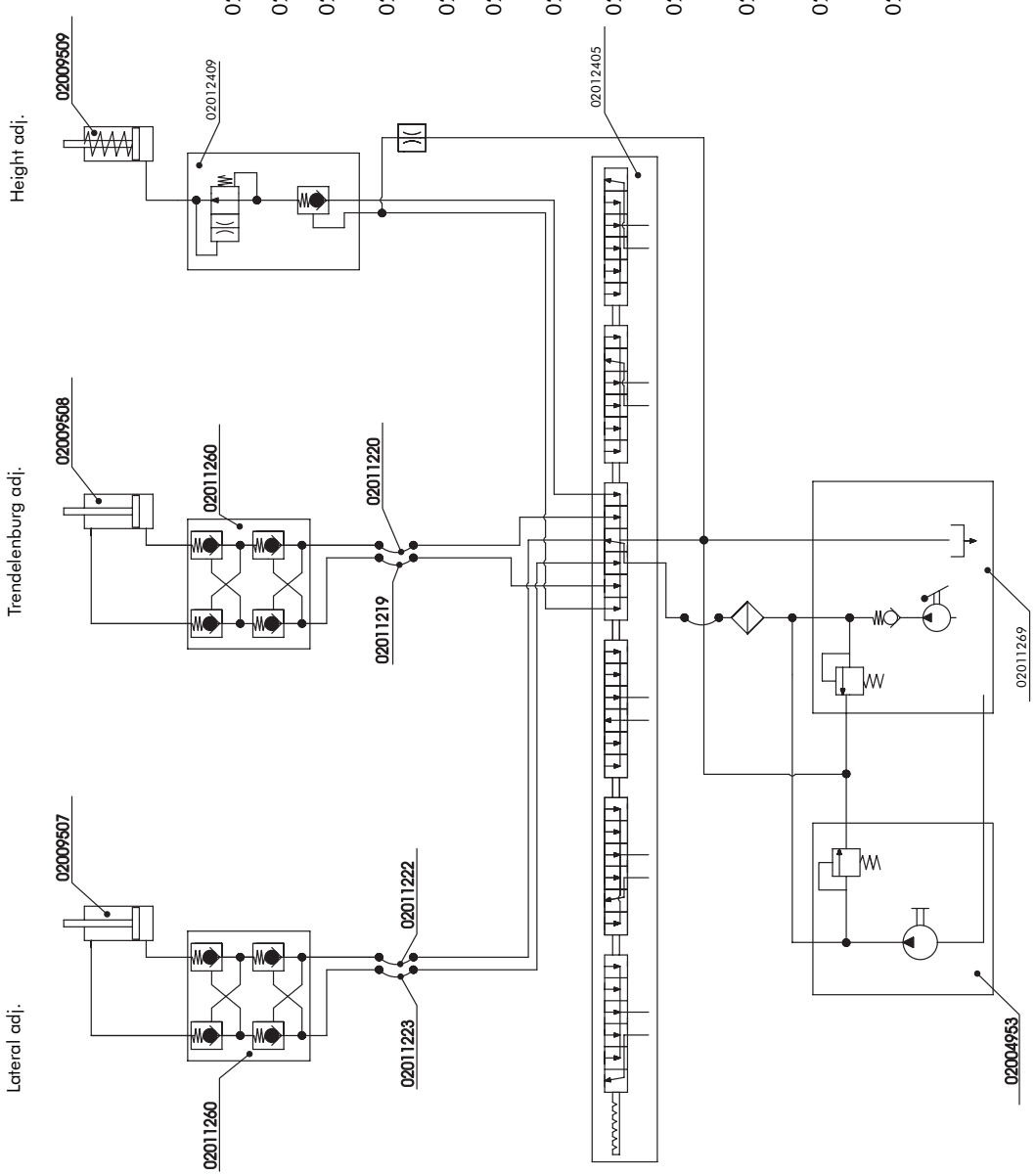
	OPX mobilis							
	200	**300 C**	**300 CL**	**300 CE**	**300 CLE**	**RC30 RC30/G**	**RC30L RC30L/G**	**RC40 RC40/G**
Safety classification	2 ⊡							
Applied part	type B ⍋ According to European Standard 60601-2-46 the maximum admissible leakage currents meet the CF ♥ requirement.							
Int 1min/4min	—			The appliance is not designed for uninterrupted duty. A 4 minutes interval is recommended after 1 minute's full-load operation.				
Protection against penetrating of fluids	IXP4							
Protection against inflammable mixtures	AP ⍟							
Fuses employed	—			Fine-wire fuses 5 ×20mm F1 = 10A, slow-blow type / F2 = 2A, medium time lag type				
Battery type employed	—			4 pcs; 6 V; 13.5 Ah				
Input AC of the battery charger	—			117V or 230V / 50 to 60Hz / 0.4A				
Output DC of the battery charger				27.6V / 1.4A				
Internal fuses of the battery charger	—			Fine-wire fuses 5 × 20mm: 2 pcs 0.4A, slow-blow type / 1 pc 2.0A, slow-blow type				
Manufacturer	Schmitz u. Söhne GmbH & Co. KG P. O. Box 1461, D-58734 Wickede (Ruhr) Zum Ostenfeld 29, D-58739 Wickede (Ruhr) Germany phone +49 (2377) 840 fax +49 (2377) 84162 http://www.schmitz-soehne.de e-mail Domestic sales dept.: zentrale@schmitz-soehne.de e-mail Exports dept.: export@schmitz-soehne.de e-mail After-sales service: service@schmitz-soehne.de							

Under reservation of changes in construction and measurements.

Block diagram electric system

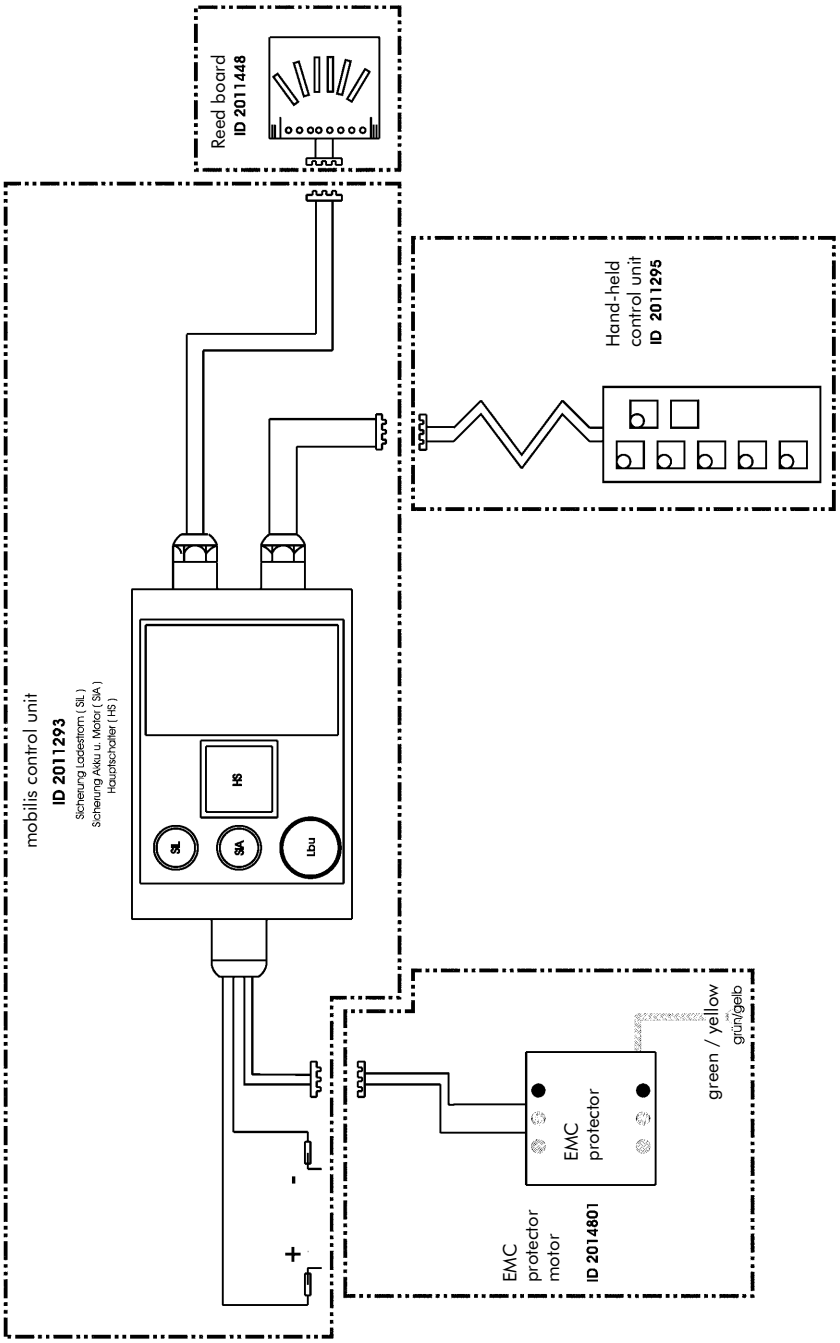


Block diagram hydraulic system

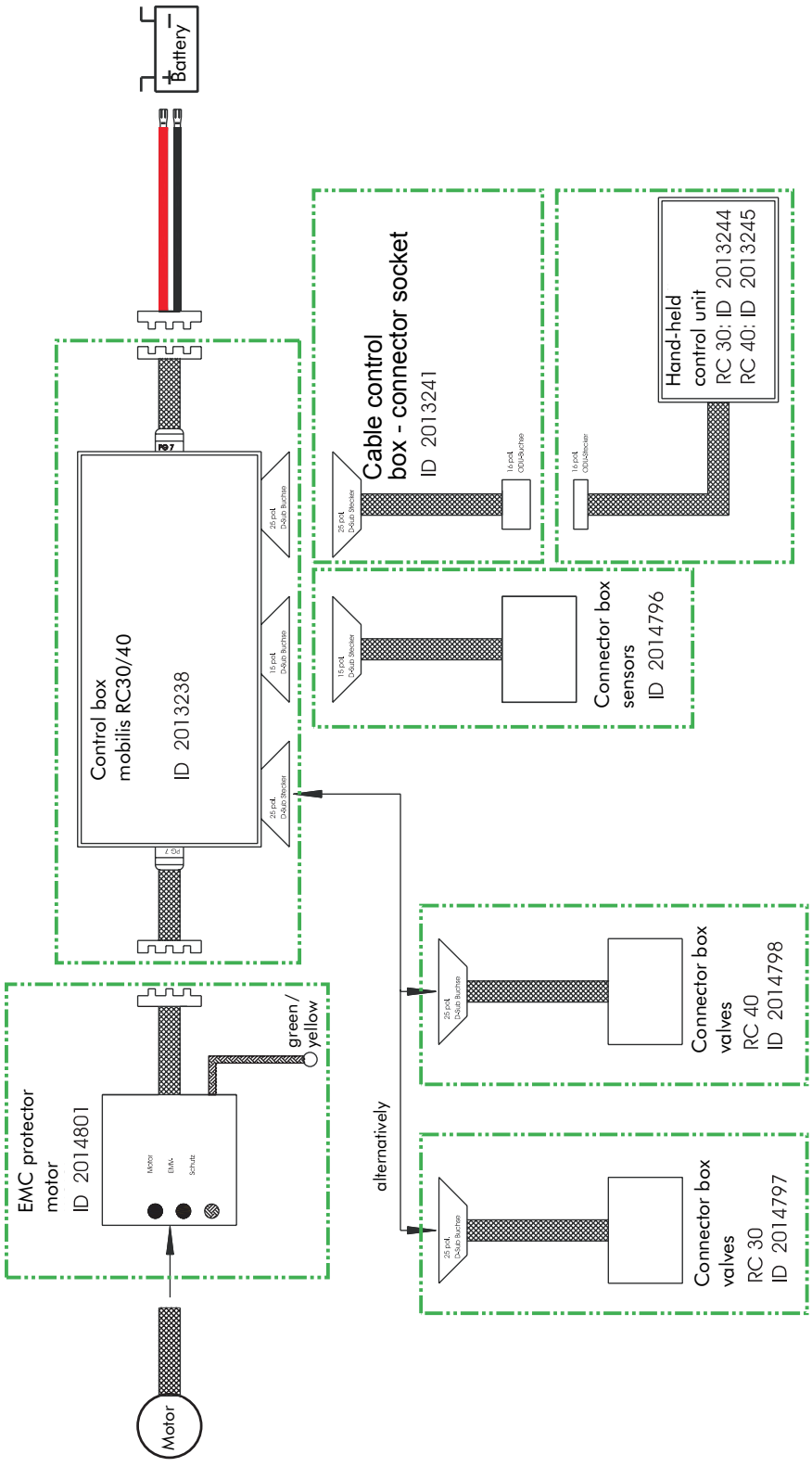


02004953	Electric pump, compl.
02011269	Foot pump, compl.
02012405	Slide valve, compl.
02012409	Lowering valve with integrated throttle
02011260	Double-piloted check valve
02009507	Lateral adjustment cylinder
02009508	Trendelenburg adjustment cylinder
02009509	Height adjustment cylinder
02011223	Hydr. hose lateral adjustment (rod)
02011222	Hydr. hose lateral adjustment (piston)
02011219	Hydr. hose Trendelenburg adjustment (rod)
02011220	Hydr. hose Trendelenburg adjustment (piston)

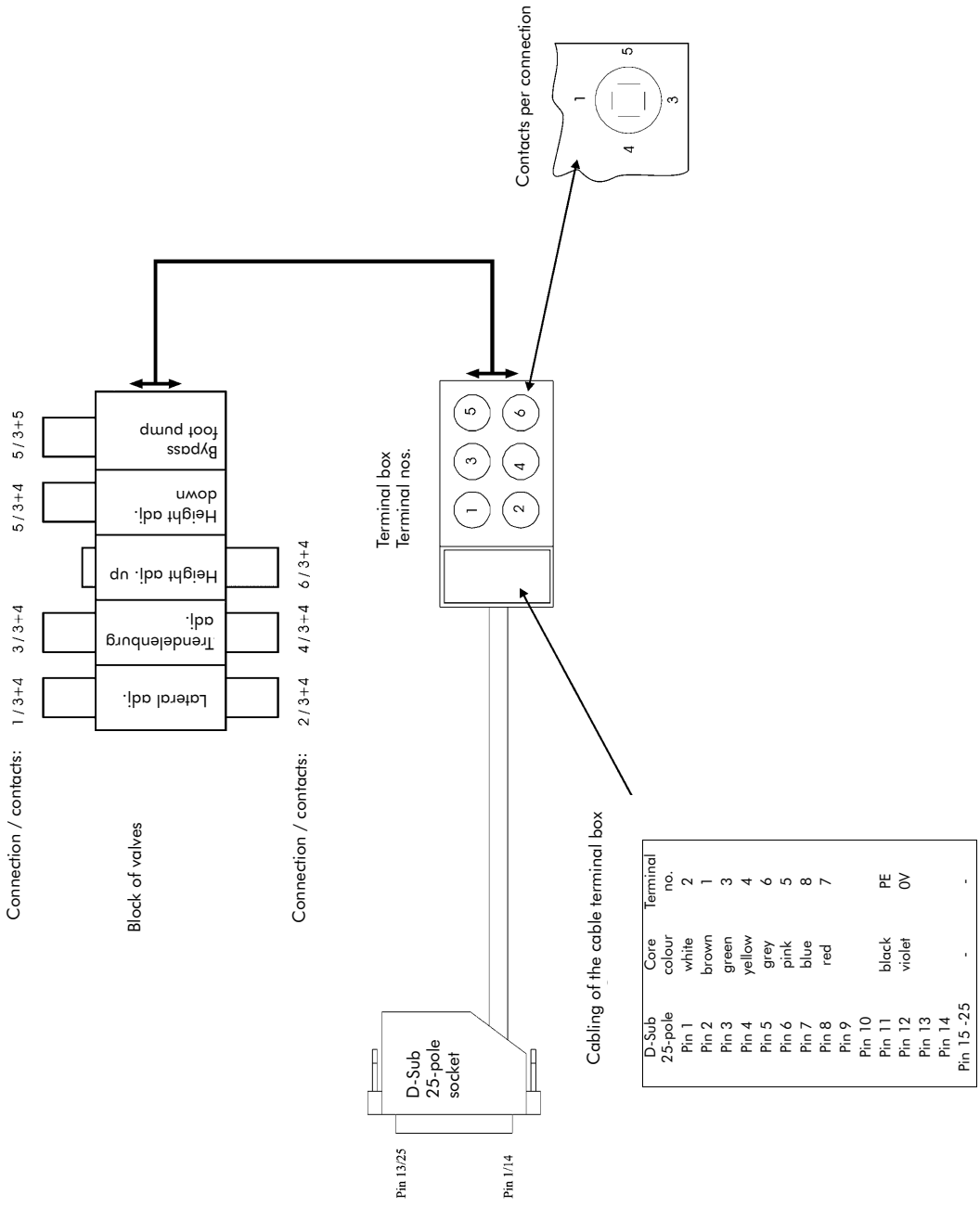
Overview electric system mobilis 300 E



Overview electric system mobilis RC 30/40

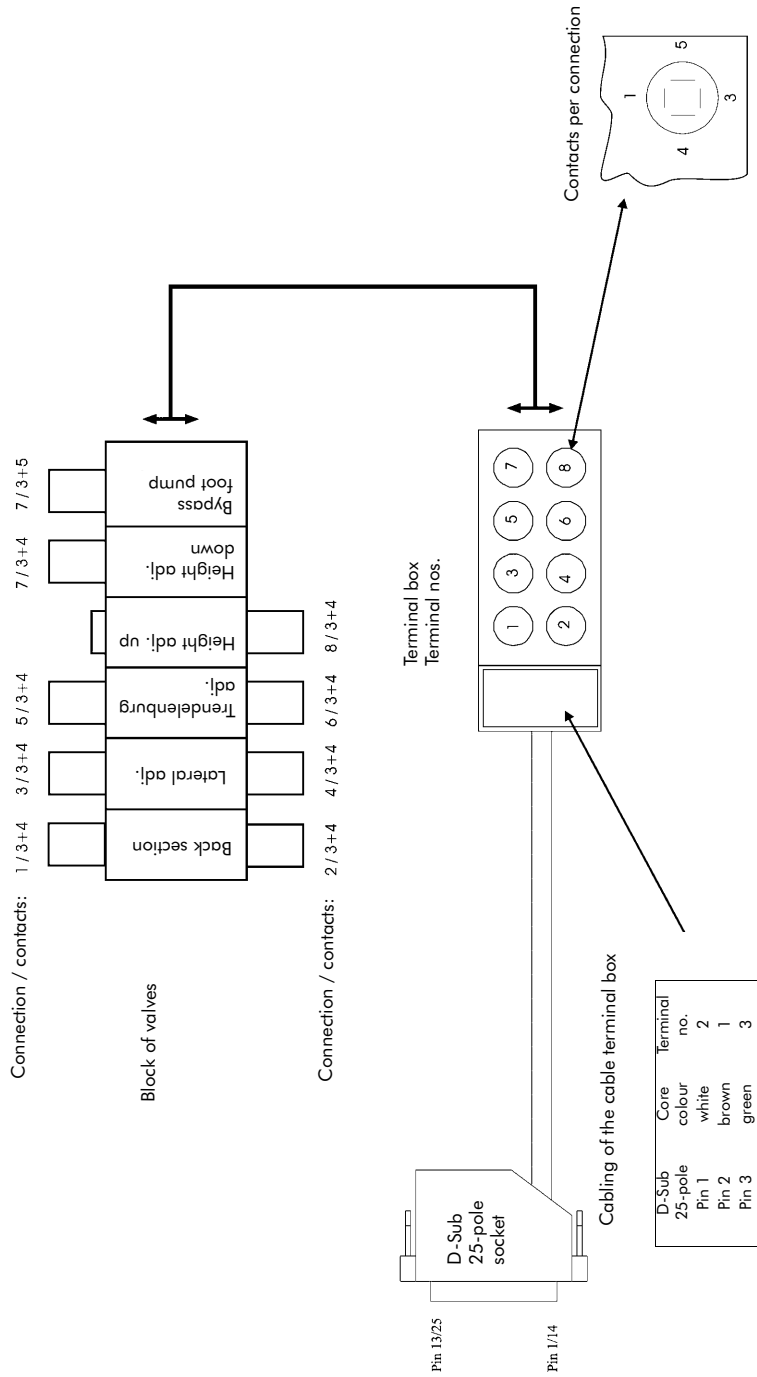


Cabling of the valves mobilis RC30


Contacts per connection
Terminal box
Terminal nos.
Block of valves
Connection / contacts: 1 / 3+4 3 / 3+4 5 / 3+4 5 / 3+5
Lateral adj.
Trendelenburg adj.
Height adj. up
Height adj. down
Bypass foot pump
Connection / contacts: 2 / 3+4 4 / 3+4 6 / 3+4
D-Sub 25-pole socket
Pin 13/25
Pin 1/14
Cabling of the cable terminal box

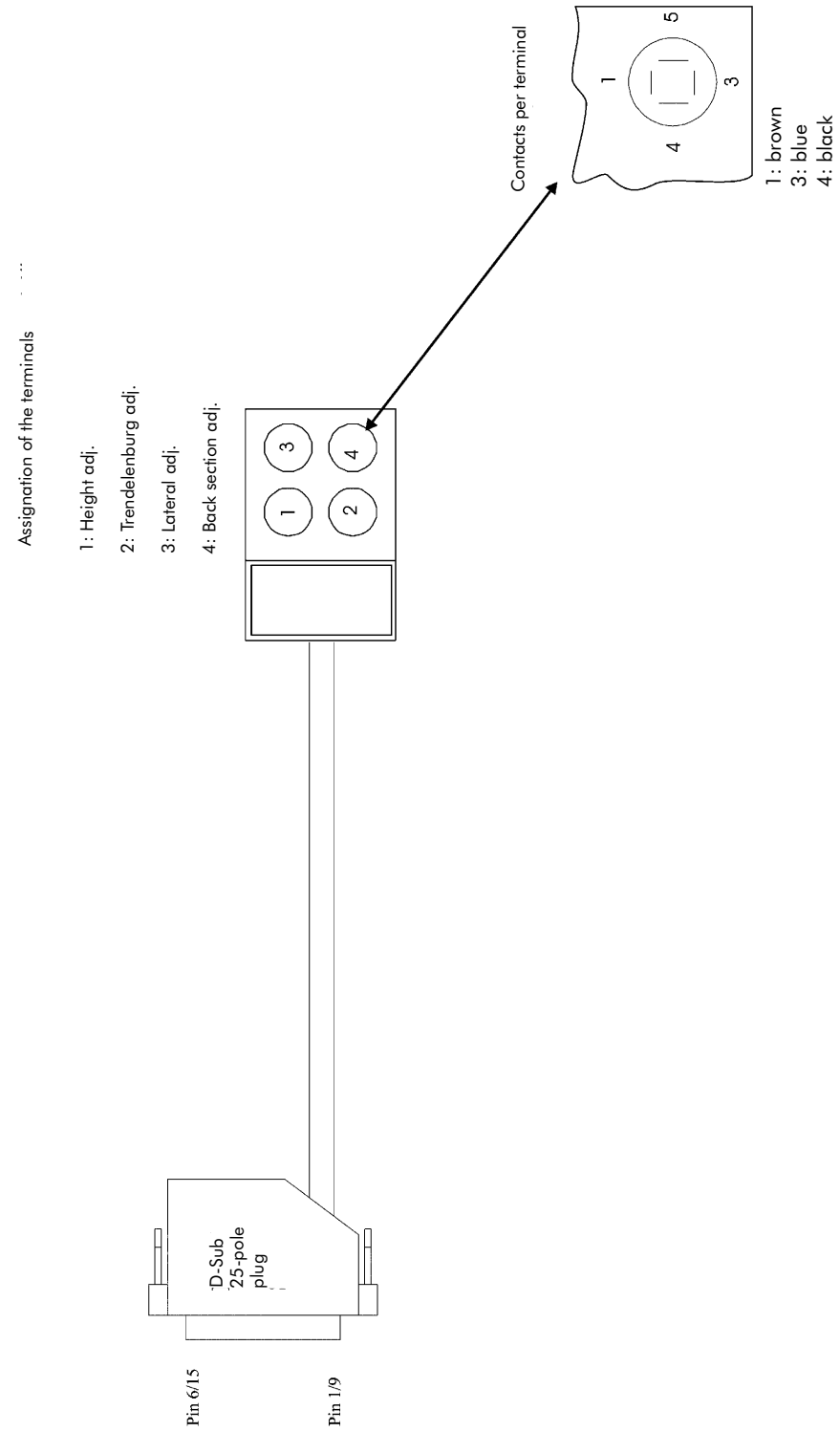
D-Sub 25-pole	Core colour	Terminal no.
Pin 1	white	2
Pin 2	brown	1
Pin 3	green	3
Pin 4	yellow	4
Pin 5	grey	6
Pin 6	pink	5
Pin 7	blue	8
Pin 8	red	7
Pin 9		
Pin 10		
Pin 11	black	PE
Pin 12	violet	0V
Pin 13		
Pin 14		
Pin 15 -25	-	-

Cabling of the valves mobilis RC40

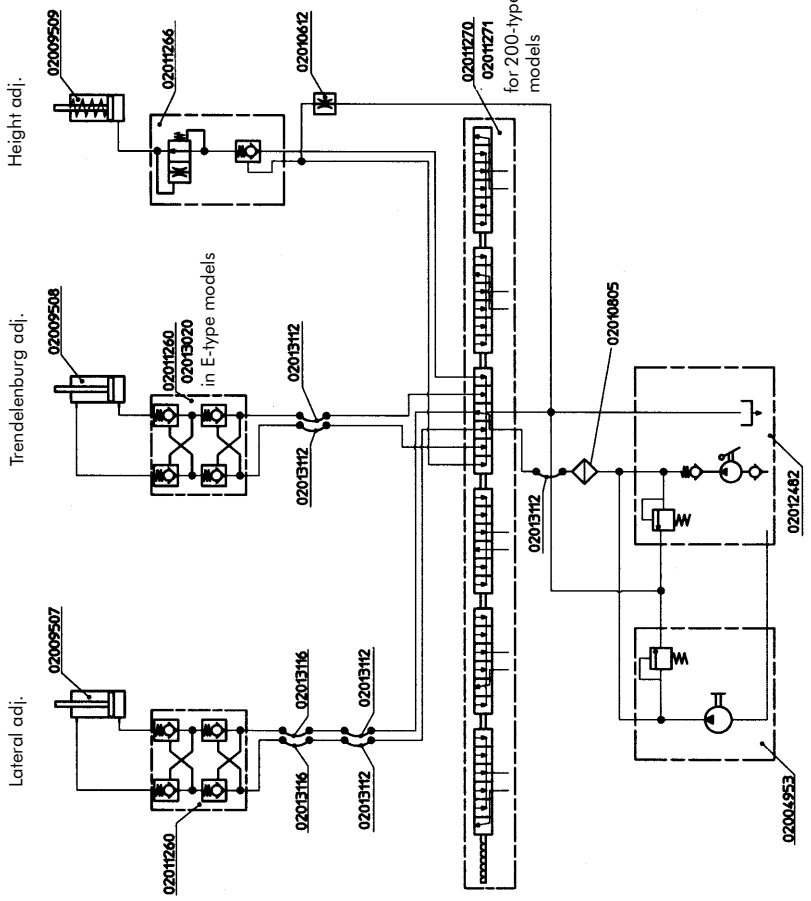


D-Sub 25-pole	Core colour	Terminal no.
Pin 1	white	2
Pin 2	brown	1
Pin 3	green	3
Pin 4	yellow	4
Pin 5	grey	6
Pin 6	pink	5
Pin 7	blue	8
Pin 8	red	7
Pin 9		
Pin 10		
Pin 11	black	PE
Pin 12	violet	0V
Pin 13		
Pin 14		
Pin 15 -25	-	-

Cabling of the sensors, mobilis RC30/40

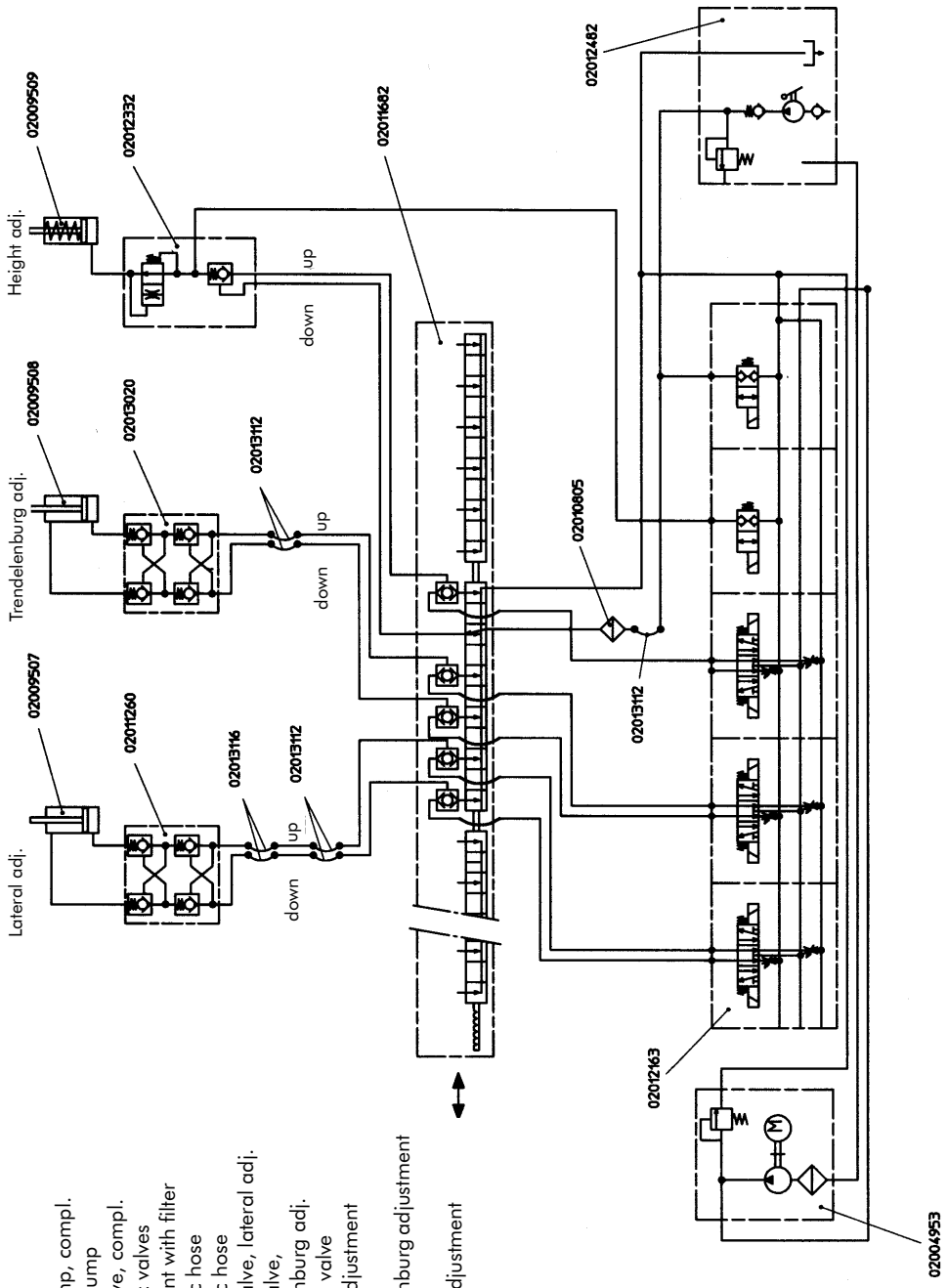


Hydraulic diagram mobilis 200 to 300E



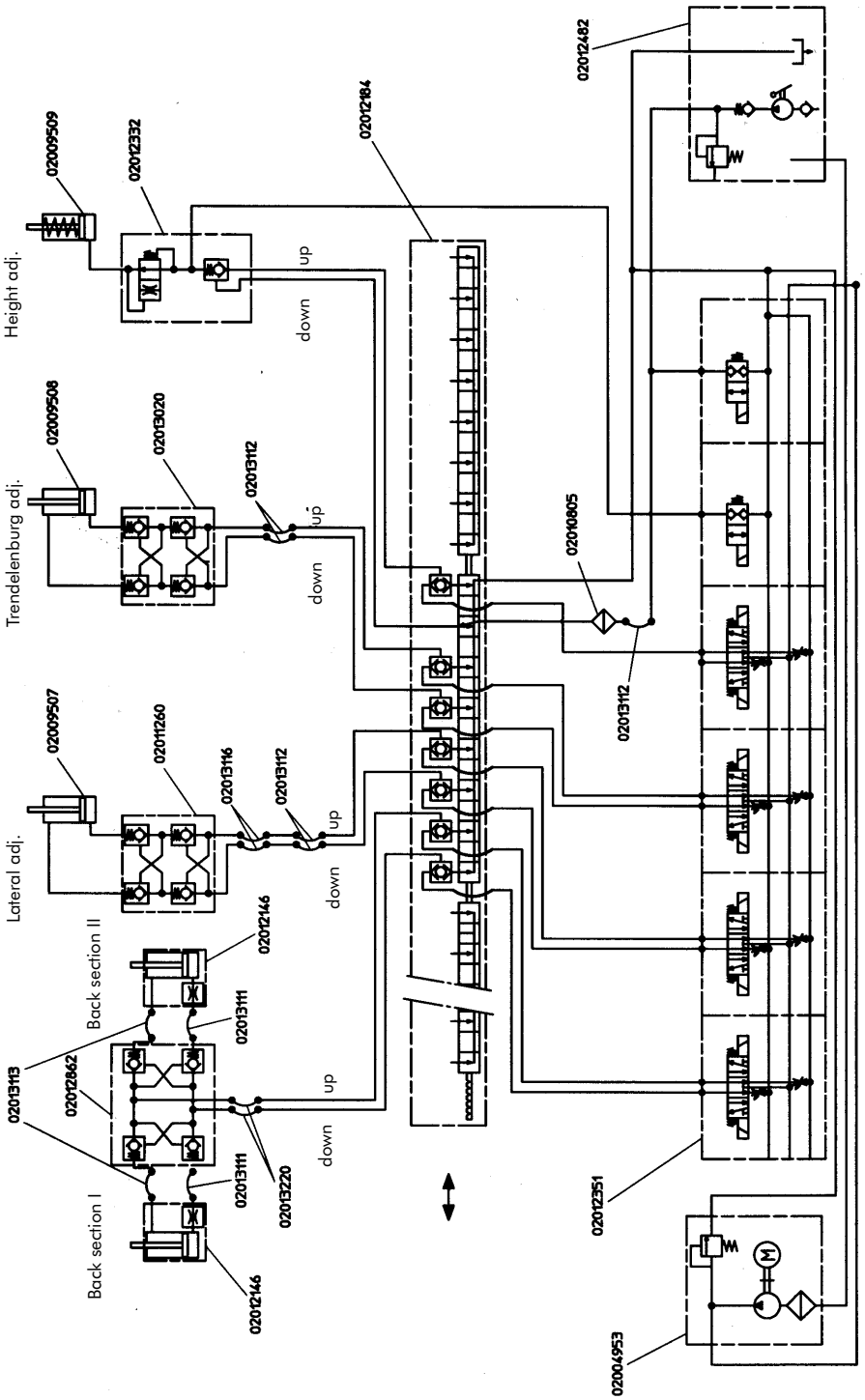
02004953	Electric pump, compl.
02012482	Foot pump, compl.
02011270	Slide valve, compl.
02011271	Slide valve, compl. for 200-type models
02011266	Lowering valve
02011260	Double-piloted check valve
02011220	Double-piloted check valve for E-type models
02009507	Lateral adjustment cylinder
02009508	Trendelenburg adjustment cylinder
02009509	Height adjustment cylinder
02013112	Hose D8 × 510
02013116	Hose D8 × 190
02010805	Screw joint with filter

Hydraulic diagram mobilis RC30



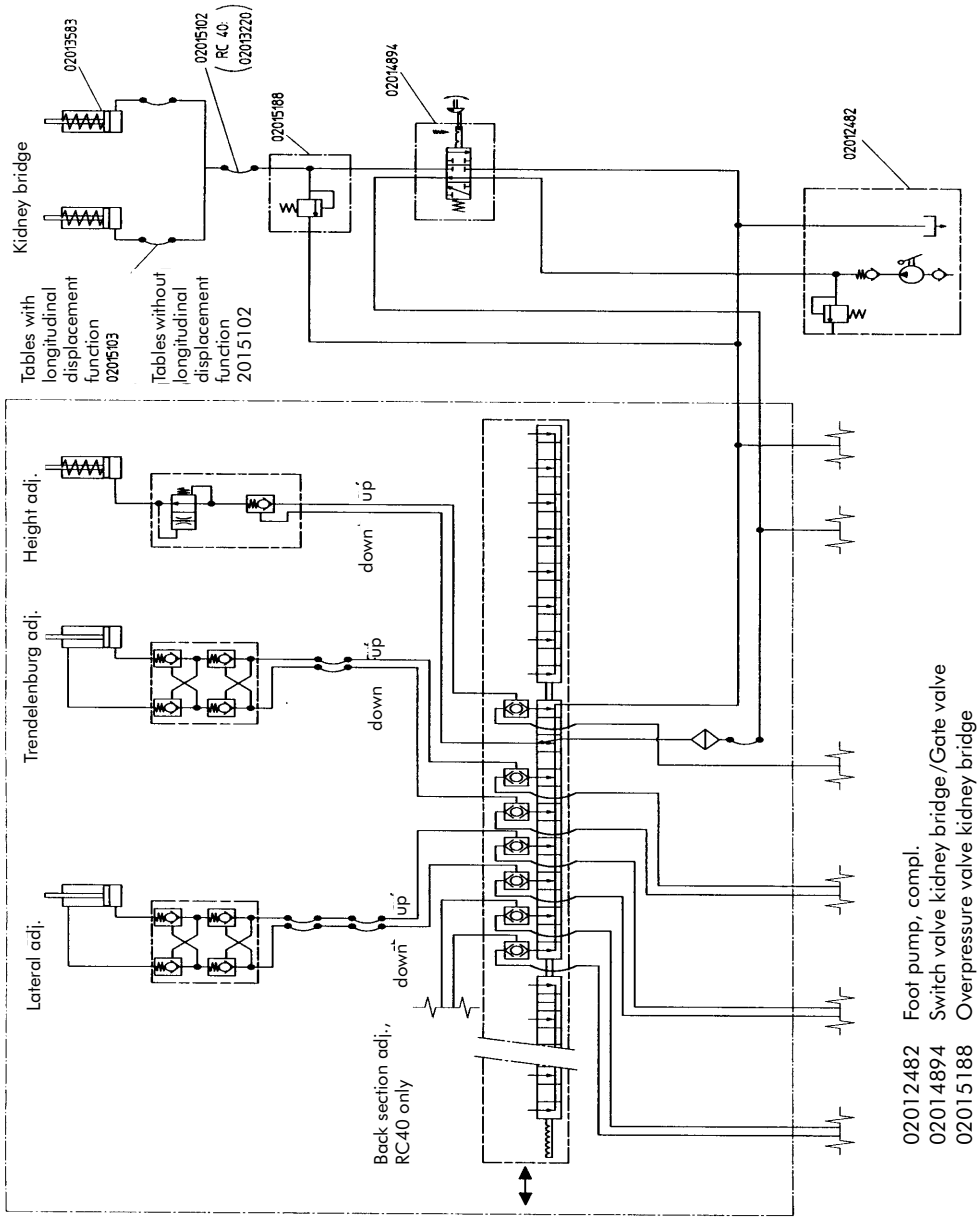
02012482 Foot pump, compl.
02004953 Electric pump
02011682 Slide valve, compl.
02012163 Magnetic valves
02010805 Screw joint with filter
02013112 Hydraulic hose
02013116 Hydraulic hose
02011260 Check valve, lateral adj.
02013020 Check valve, Trendelenburg adj.
02012332 Lowering valve
02009509 Height adjustment cylinder
02009508 Trendelenburg adjustment cylinder
02009507 Lateral adjustment cylinder

Hydraulic diagram mobilis RC40



02012482	Foot pump, compl.	02013220	Hydraulic hose
02004953	Electric pump	02011260	Trendelenburg adjustment cylinder
02012184	Gate valve	02013020	Check valve, Trendelenburg adj.
02012351	Magnetic valves	02012862	Check valve, back section adj.
02010805	Screw joint with filter	02012332	Lowering valve
02013111	Hydraulic hose	02009509	Height adj. cylinder
02013112	Hydraulic hose	02009508	Trendelenburg adj. cylinder
02011260	Check valve, lateral adj.	02009507	Lateral adj. cylinder
02013113	Hydraulic hose	02012146	Back section adj. cylinder
02013116	Hydraulic hose		

Hydraulic diagram mobilis kidney bridge



02012482 Foot pump, compl.
02014894 Switch valve kidney bridge/Gate valve
02015188 Overpressure valve kidney bridge
02013583 Cylinder kidney bridge
02015102
02013220 Hydraulic hoses for kidney bridge
02015103

Spare parts

Technical descriptions such as circuit diagrams, exploded views, repair instructions or spare parts lists can be obtained upon request from Schmitz u. Söhne.

When ordering technical descriptions or spare parts at the manufacturer's, kindly indicate the reference no., the serial no. and the project no. of the operating table. You will find these data on the nameplate of the operating table.

Customer service

phone +49 (2377) 84549

Schmitz u. Söhne GmbH & Co. KG
Postfach 1461, D-58734 Wickede (Ruhr)
Zum Ostenfeld 29, D-58739 Wickede (Ruhr)
Germany
Phone +49 (2377) 840
Fax +49 (2377) 84162
http://www.schmitz-soehne.de
e-mail: export@schmitz-soehne.de

Branch offices

Spain
SCHMITZ u. Söhne Ibérica S.L.
Avda de Bruselas 58, semisótano
E-28028 Madrid
Phone/Fax +34 (91) 7130000

Switzerland
SCHMITZ AG
Buchbergstraße 9
CH-8200 Schaffhausen
Phone +41 (52) 6432505
Fax +41 (52) 6432691

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